

**MODERATING EFFECT OF BOARD FINANCIAL EXPERTISE ON  
CAMELS FRAMEWORK AND FINANCIAL PERFORMANCE OF  
COMMERCIAL BANKS IN KENYA**

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## DECLARATION

### Declaration by the Candidate

This research project is my original work and has not been presented for a degree in any other university. No part of this project should be reproduced without prior consent or permission of the author or that of Moi University.

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## **DEDICATION**

This research project is dedicated to my parents, siblings and the entire Moi University for it is through their assistance that this was achieved.

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I give special thanks to God for good health and strength accorded to me during my study.

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## ABSTRACT

Bank financial performance is a major concern in developing countries because financial markets are usually under developed. Banks are therefore, considered the major source of finance for the majority of firms and main depository of economic savings. The poor performance of the banking sector has resulted to frequent distress in the banking sector and collapse of banks. Studies have documented that CAMELS framework are associated with financial performance, but little is known about the moderating mechanism underlying the relationship between CAMELS framework, Board Financial Expertise and financial performance of commercial banks. The purpose of this study was to determine the moderating effect of board financial expertise on the relationship between CAMELS frameworks and financial performance of commercial banks in Kenya. The study specific objectives were to determine the effect of capital adequacy, asset quality, management efficiency, earnings quality, liquidity and sensitivity of market risk on financial performance of commercial banks in Kenya. The study was guided by Resource Based view, Upper Echelon Theory, Human Capital theory and Efficiency Structure theory. Both explanatory and longitudinal research design were adopted while the study targeted all commercial banks from 2010 to 2020. The data collected was analyzed using a hierarchical multiple regression model. A panel regression analysis results indicated that capital adequacy ( $\beta = .0971, \rho < .05$ ), asset quality ( $\beta = .592, \rho < .05$ ), ( $\beta = .58, \rho < .05$ ), earning quality ( $\beta = .343, \rho < .05$ ) and liquidity ( $\beta = .973, \rho < .05$ ) had a positive and significant effect on financial performance of commercial banks in Kenya. Sensitivity of market risks ( $\beta = -.62, \rho < .05$ ), had a negative and significant effect on financial performance of commercial banks in Kenya. However, firm size ( $\beta = -.832, \rho > .05$ ) and firm age ( $\beta = .399, \rho > .05$ ) had no significant effect on financial performance of commercial banks in Kenya. Further, Board financial expertise positively moderated the relationship between capital adequacy ( $\beta = 2.95, \rho > .05$ ), asset quality ( $\beta = 0.02, \rho > .05$ ), management efficiency ( $\beta = .28, \rho > .05$ ) and financial performance of commercial banks in Kenya. The study concluded that capital adequacy, asset quality, and management efficiency are key predictors of financial performance of commercial banks in Kenya. In addition, board financial expertise is an enhancing moderator in both liquidity and sensitivity in relation to financial performance of commercial banks in Kenya. On the contrary, board financial expertise is a buffering moderator in the relationship between earning quality and financial performance of commercial banks in Kenya. The study recommended that commercial banks have adequate levels of capital. Also, to improve bank financial performance through asset quality, it is important to focus on key areas such as credit risk, interest rate risk, and operational risk. Further, there is a need for the board to ensure that the management team has the financial expertise necessary to make sound decisions. Additionally, it is important to improve the financial expertise of the board so that they can provide better oversight of the bank's financial operations and help to enhance the financial performance. Finally, banks can tackle the sensitivity of market risk and improve their financial performance by hedging their portfolios, managing their liquidity, and stress-testing their portfolios.

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**ABBREVIATIONS & ACRONYMS**

CAMELS	Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, Liquidity and Sensitivity to market risks.
CEO	Chief Executive Officer
EBIT	Earnings before Interest and Taxes
EVA	Economic value added
FEPS	Forecast Earnings per Share
NPL	Non-Performing Loans
NSE	Nairobi Security Exchange
ROA	Return on Asset
ROS	Return on Sales

**OPERATIONAL DEFINITION OF TERMS**

Asset quality	Is an aspect of bank management involving evaluation of assets in order to facilitate measurement of level and size of credit risk associated with its operation. (Muchiri, 2016)
Board financial expertise	Is the level of financial and accounting skills, experience and knowledge that board members possess (Ararat <i>et al.</i> , 2015).
CAMELS framework	An international rating system used by regulatory banking authorities to rate financial institutions according to the six factors represented by the acronym. (Capital Adequacy, Asset Quality, Management, Earnings Quality, Liquidity and Sensitivity to market risks.) (Anaekenwa, 2019)
Capital adequacy	Capital adequacy denotes the amount of capital, equal to or above capital requirements by the regulator. (Bouheni, 2014).
Earnings quality	Is the ability of reported earnings to reflect the company's true earnings, as well as the usefulness of reported earnings to predict future earnings (Bellovary <i>et al.</i> , 2005)
Firm Age	Is the time a firm has existed since incorporation. (Albitar, 2015)

Financial performance	Is the measure of the financial health of the organization and shows the performance of the executive leadership of the company. (Matar A, 2018)
Liquidity	Is the firm's ability to fulfill its short-term obligations as they come due (Gitman, 2015)
Sensitivity of Market Risks	Is the extent to which the changes in interest rates, foreign exchange rates and inflation rates affect earnings. (Anaeenwa, 2019)

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Introduction**

This chapter deals with the background of the study, research hypothesis, significance of the study and scope of the study.

#### **1.1 Background of the Study**

Financial performance is the measure of the financial health of the organization and shows the performance of the executive leadership of the company. The higher the financial performance of the bank, the more effective and efficient the bank is in using the resources and later contributes at the macro-economic level in country's economy (Matar & Eneizan, 2018).

Financial performance is the focus of any business and only through performance are organizations able to grow and progress (Gavrea *et al.*, 2011). Similarly, the survival of a business is to accomplish set goals and objectives (Muduenyi *et al.*, 2015). According to Yazdanfar (2013), one of the important preconditions for long-term firm survival and success is firm profitability. Financial performance is defined as the achievement of a firm's strategic goals and objectives (Almatrooshi, Singh, & Farouk, 2016). Financial Performance is a vital and crucial issue and assessing the financial performance of banks is about examining its development towards accomplishing goals.

Commercial banks play an important role in the allocation of economic resources by facilitating and channeling funds from depositors to stockholders in a constant way. (Sangmi & Nazir, 2010) Sound financial health of a bank is a guarantee to its depositors, shareholders, employees and the economy as a whole. Jain and Jaishwal (2016) argued

that the financial sector is the backbone of the economy. The whole scenarios of the economic activities and the development of a country can be determined by the condition of the banking sector. Bank's financial performance is not only important for the investors but also for the scholars as it is important to understand the factors affecting financial performance of the firms.

CAMELS rating system is an international supervisory tool for evaluating the soundness of financial institutions on a uniform basis. It is a ratio based model for evaluating the performance of banks and is composed of six parameters: capital adequacy, asset quality, management efficiency, earnings quality, liquidity management and sensitivity to market risks. (Zahidur, 2018)

Sunash, Chitra and Bardastani (2016) used CAMELS ranking approach to evaluate and compare the performance of retail conventional and Islamic banks in the Kingdom of Bahrain for the period of 2007 to 2014. Echekeba, Chinedu and Ezu (2014) determined the impact of CAMELS parameters on the profitability of Nigerian commercial banks for the period of 2001 to 2010 and found that Capital adequacy, asset quality, management efficiency and earnings quality did not influence profitability while liquidity significantly bank's profitability.

Almajali, Alamro, and Al-Soub (2012) found that returns on assets used as the dependent variables was significantly affected by the management competence, liquidity, size of the company and leverage. This study will use variables under CAMELS framework, which include capital adequacy, asset quality, earnings quality, liquidity management and sensitivity of the market.

Capital adequacy denotes a commercial bank's measurement of their strength or ability in terms of financial matters (Pellegrina, 2012). It determines the bank's willingness



and capacity to endure irregular and operational misfortunes. It demonstrates the company's capability to embrace extra or additional businesses. It also gauges the commercial banks' capacity to adequately adapt to risks and liquidation (Liao, 2013). Adequacy of capital is among the most regulated aspect in the banking industry across the globe with an emphasis on making sure that commercial banks have enough capital to compensate for risks they are exposed to (Aliyu, Yusof, & Naiimi, 2017). Capital adequacy has an impact on stakeholder trust and confidence towards the company and it is among the fundamental parameters of gauging the commercial banks' performance (Pellegrina, 2012). There, however, lacks consensus among empirical studies on the influence of capital adequacy on commercial banks' financial performance as studies present conflicting findings.

The degree of financial strength of commercial banks can be assessed by the quality of assets maintained (Zahidur, 2018). Asset quality greatly depends on the borrower's ability to repay the loans in due time. The biggest risks faced by commercial banks is the risk of loan losses that may increase due to increase in non-performing loans.

Although the asset quality is important for all companies, it has significant importance on profitability of banks that are crucial components of financial markets and proper process of the banking operations as well as the financial system and accordingly national economy.

The operations of banks are characterized by high level of risks that require the management of banks' loan assets, Asset Quality (AQ), involving the evaluation of the banks' assets to measure the extent of credit risk that arises from operating activities. AQ in banks has more to do with the quality of loans that banks provide (Amuakwa-Mensah and Boakye-Adjei, 2015).

Management measures the efficiency of the company to minimize and reduce costs and increase profits to prevent the possibility of bank failures (Ladhem, 2020). Management efficiency is very important for firms to enhance its market performance, stay competitive (Nguyen and Swanson, 2009), and be less vulnerable to outside competition (Callice et al., 2019). Management efficiency is an important factor to ensure the health, stability, and growth of the banks but it is difficult to measure because it is a primarily qualitative factor (Dash, 2017). It considers as an indicator of administrative efficiency.

Efficiency is a vital element of the bank's success because high efficiency indicates the high performance of the firm. Ghasempour & Salami (2016) have revealed that management efficiency indicates the ability of management and board of directors to capture, measure, and control the risk associated with banking activities to ensure sound banking operation. Aspal & Dhawan (2016) suggest that management efficiency depends on prescribed norms of management, management capabilities to respond to changing the environment, administrative capabilities, and leadership. Measurement of management efficiency is the hardest and unpredictable task because it relates to subjective judgments and strategies of bank managers which creates using their capabilities and expertise (Roman & Sargu, 2013).

Earnings quality reflects the ability of a bank to generate and sustain profits consistently (Mikail, 2014). Good earnings help the bank in conducting present and future operation, increasing the capital base, paying dividends to shareholders, increasing the capacity to absorb losses and to ensure expansion of the business. Dempster & Oliver, (2019) discussed that Earnings Quality is an important indicator for the reliability of financial information that will be used by interested parties, such as investors, lenders, creditors and others. It contributes in providing great benefits for these decision makers (Li,

2014; Dempster & Oliver, 2019). A high quality earnings number will reflect on current operating performance, will indicate future operating performance and will accurately annuitize the intrinsic value of the firm.

Prior studies, such as by Cheng *et al.* (2019) and Chan *et al.* (2015) confirmed that earnings quality provides information about financial misstatements, and it contributes in increasing investors' confidence about earnings information. They further noted that earnings quality is used to predict future companies' returns. Beyer *et al.* (2019) and Perotti and Wagenhofer (2014) documented that earnings quality contributes in managing the magnitude of investors' uncertainty, where earnings quality provides information about the company.

Liquidity is the firm's ability to fulfill its short-term obligations as they come due (Gitman, 2015). Liquidity ratio is one of financial ratio that is often used to analyze the financial statements of companies, it refers to the solvency of firm's overall financial position with the ability to pay its bills, and it can provide sign problem of cash flow or failure business. High level of liquidity of a company will open the opportunity to get support from third parties because it shows the company has enough liquidity to operating activities. The bank must maintain adequate liquidity to cover short term liabilities.

Sensitivity to market risks is a measure of how the assets, liabilities, net worth values of the bank are to changes in the market condition such as rate of interest rates, inflation risk and foreign exchange risks. (Ladhem, 2020).

Sensitivity to market risk is latest addition to the ratings parameters and reveals the extent to which changes in foreign exchange rates, interest rates, commodity prices and equity prices can influence earnings and capital of banks. (Saeed, *et al.*, 2020). Market

risk sensitivity relates to a bank's ability to deal with market fluctuation, the market can become very volatile due to good news or bad news. A sensitive market is vulnerable to uncontrollable fluctuations in prices and interest rates. Many banks try to avoid sensitive markets by fixing interest rates or gradually divulging good and bad news, so that their share prices fluctuate smoothly and consistently. An increase in the interest rate will have a negative impact on the development of bank loans and can even cause bad credit (Supriyono and Herdhayitna, 2019; Golubeva et al., 2019).

Due to worldwide corporate governance failures and accounting scandals in recent years, interest has grown in studying the role and responsibility of the board of directors in performance of a firm. Upper Echelon theory explains how executive characteristics and experiences shape their perceptions, choices and actions in ways that affect a firm's outcome. Some view that director financial expertise is an essential dimension of corporate governance and plays a vital role in governance (Ujunwa, Salami, & Umar 2013; Osazuwa *et al.*, 2016). Financially expert directors can play a key role in ensuring transparency, integrity and accountability on a wide range of corporate issues (Johl *et al.*, 2015). Gunner *et al.* (2008) stressed that it was important for board members to understand accounting principles and financial statements, which will lead to better board oversight and serve to the better interests of shareholders. According to Ettredge *et al.* (2019), directors with financial expertise are more effective based on resource-based theory. They can perform better on the board, as financial expertise enhances their competencies compared to independent directors.

A financial expert is a person with educational background in economics, finance and/or accounting or has work experience as an accountant, chief financial officer, auditor, finance manager, financial analyst or financial advisor in a financial or a non-

financial firm (Sarwar, 2018). Experts are associated with policies that may create value for their financial institutions.

Financial experts on the board of directors are an important part of internal control mechanisms to control agency problems among managers and shareholders. (Gurner, 2008) Argue that financial experts on the board will enable the board to monitor managers and serve shareholders' interests efficiently because they have to bear lower costs to acquire information regarding complexity and risks attached to certain financial transactions.

(Bonaziz, 2012) Found that financial expertise has a significant impact on returns on equity and returns on assets. Having a board member that possesses financial expertise is likely to reduce earnings management for firms where the corporate governance mechanism are weak and firms with higher quality earnings are more associated with board members who have financial expertise. (Ojeka, 2014) Board financial Expertise have positive coefficients and significantly influence the firm's financial performance.

(Garcia-Sanchez, 2017) Reported that financial experts on the board lead to enhanced corporate governance by improving board-monitoring abilities to protect shareholders' interests and improving accounting conservatism as well as earning quality in the banking industry. Board financial expertise improves financial performance (Adams, 2017).

Various Acts such as The Companies Act, the Banking Act, the Central Bank of Kenya Act and various other prudential guidelines that have been issued by the Central Bank of Kenya (CBK) over the years, govern the banking sector in Kenya. The banking sector in Kenya was liberalized in 1995 which led to the removal of exchange controls. The CBK is responsible for formulating and implementing the monetary policy adopted by

the Kenyan government and ensuring there is liquidity, solvency and proper functioning of the financial system in the country.

The CBK also publishes valuable information related to the banking industry in Kenya and the non-banking financial institutions, as well as information about the interest rates prevalent in the country and other publications and guidelines. The Kenyan commercial banks have come together under an umbrella body referred to as the Kenya Bankers Association (KBA), which serves as a lobby body for the members' interests and addresses issues affecting the registered commercial banks in the country (CBK, 2013). In Kenya, the performance of commercial banks has been influenced by various factors such as the ability of banks to meet the regulatory requirements, these has influenced the performance in negative as well as positive ways depending on the financial expertise and the management skills of the board of the commercial banks.

The general objective of this study was to determine the effect of CAMELS framework, moderating effect of board financial expertise on financial performance of commercial banks in Kenya.

## **1.2 Statement of the Problem**

Bank performance is more pronounced in developing countries because financial markets are under developed and therefore considered as the major source of finance in a country. Commercial banks are channels used to transmit effective monetary policy of the central bank to the economy, thus, it is considered that they also share the responsibility of stabilizing the economy of the country.

In Kenya, the Central Bank of Kenya is responsible for formulating and implementing monetary policies adopted by the Kenyan government and ensuring there is liquidity, solvency and proper functioning of the financial system in the country. However,

despite this high level of regulation, the recent past has seen banks such as Chase bank, Dubai bank and Imperial bank undergo receivership due to poor performance and inability to perform daily businesses (Central Bank of Kenya). Central bank report has recorded a significant drop in the average ROE over the years. The poor performance of the banking sector has been attributed to problems such as; inadequate capital, high non-performing assets and mismanagement of funds by the managers which has led to frequent distress in the banking sector and collapse of some banks (Agbada & Osuji, 2013).

Several studies have investigated several determinants of commercial banks in Kenya. Others have even looked at the effect of CAMELS model on performance of commercial banks in Kenya. However, this study did not find conclusive finding on all variables of CAMELS model and especially the latest variable (sensitivity of market risk). In addition, this study included Board Financial Expertise as a moderating variable. Calls for reforms of the financial sector argue that the lack of financial expertise of board members play a major role in a financial crisis. However, banks with more financial expertise might pursue riskier strategies with less capital to support them, hence become vulnerable in a crisis. (Acharya et al, 2011). Financial experts in the board of directors are important as shown in human capital theory; human beings can increase their productive capacity through greater education and skill training.

This research was conducted with aim of finding effect of CAMELS framework, board financial expertise on financial performance of commercial banks in Kenya and covered a period of 15 years from 2010-2020.

### **1.3 General Objective**

The general objective of the study was to determine the Moderating Effect of Board Financial Expertise on CAMELS Framework and Financial Performance of Commercial Banks Kenya.

#### **1.3.1 Specific Objectives**

This research focused on the following specific objectives:

1. To determine the effect of capital adequacy on financial performance of commercial banks in Kenya
2. To elaborate the effect of asset quality on financial performance of commercial banks in Kenya
3. To establish the effect of management efficiency of financial performance of commercial banks.
4. To elaborate the effect of earnings quality on financial performance of commercial banks in Kenya
5. To assess the effect of liquidity on financial performance of commercial banks in Kenya
6. To find the effect of sensitivity of market risk on financial performance of commercial banks.
7. a) To determine moderating effect of board financial expertise on the relationship between capital adequacy and financial performance of commercial banks in Kenya  
b) To determine moderating effect of board financial expertise on the relationship between asset quality and financial performance of commercial banks in Kenya



- c) To determine moderating effect of board financial expertise on the relationship between management efficiency and financial performance of commercial banks in Kenya.
- d) To determine moderating effect of board financial expertise on the relationship between earnings quality and financial performance of commercial banks in Kenya
- e) To determine moderating effect of board financial expertise on the relationship between liquidity and financial performance of commercial banks in Kenya
- f) To determine moderating effect of board financial expertise on the relationship between sensitivity of market risk and financial performance of commercial banks.

#### **1.4 Research Hypotheses**

Based on the stated specific objectives, the following null hypotheses were derived and tested.

- H<sub>01</sub>:** Capital adequacy has no moderating effect on financial performance of commercial banks in Kenya.
- H<sub>02</sub>:** Asset quality has no moderating effect on financial performance of commercial banks in Kenya.
- H<sub>03</sub>:** Management efficiency has no moderating effect on financial performance of commercial banks in Kenya.
- H<sub>04</sub>:** Earnings quality has no moderating effect on financial performance of commercial banks in Kenya.
- H<sub>05</sub>:** Liquidity has no moderating effect on financial performance of commercial banks in Kenya.

- H<sub>06</sub>:** Sensitivity of the market risk has no moderating effect on financial position of commercial banks in Kenya.
- H<sub>07(a)</sub>:** Board Financial Expertise has no moderating relationship between capital adequacy and financial performance of commercial banks in Kenya.
- H<sub>07(b)</sub>:** Board Financial Expertise has no moderating relationship between Asset Quality and Financial Performance of commercial banks in Kenya.
- H<sub>07(c)</sub>:** Board Financial Expertise has no moderating relationship between Management Efficiency and Financial Performance of commercial banks in Kenya.
- H<sub>07(d)</sub>:** Board Financial Expertise has no moderating relationship between Earnings Quality and financial performance of commercial banks in Kenya.
- H<sub>07(e)</sub>:** Board Financial Expertise has no moderating relationship between liquidity and financial performance of commercial Banks.
- H<sub>07(f)</sub>:** Board Financial Expertise has no moderating relationship between Sensitivity of market risk and financial performance of commercial Banks.

### **1.5 Significance of the Study**

This study sought to examine the moderating effect of board financial expertise on CAMELS framework and financial performance. This study would be valuable to not only to the bank managers but also other managers in other organizations and industries. It would help them understand the effect of CAMEL framework on financial performance to achieve a competitive edge. The combination of these dimensions allows managers to measure, control, and take the appropriate decisions and actions that would assist them attain superior performance.

The study findings are important to government policy makers since effective financial characteristics may result to prudent utilization of resources resulting in improved

services to the citizens. This might help in improving the economy of the Country in general and improve the standard of living of the citizens.

The study findings are beneficial to various financial firms in regard to making decision touching on CAMELS framework. Managers would make decisions on their CAMELS ratios by borrowing from the findings of the current study

The results of this study would also be valuable to researchers and scholars, as it would form a basis for further research. Future students could use this study as a basis for discussions on the effect of CAMELS framework on financial performance. The study also provides a reference material for future researchers on other related topics and could also help other academicians who undertake the same topic in their studies. Finally, the study provides research-derived prescriptions for guiding the practitioners in pursuit of their decisions.

### **1.6 Scope of the Study**

This study focused on the moderating effect of Board Financial Expertise on CAMELS Framework and Financial Performance of Commercial Banks in Kenya. The study period was from 2010 to 2020 and targeted all commercial banks in Kenya that have been inconsistent during the period. The focus of this study was quantitative and it used a combination of both explanatory and longitudinal research design. This study was conducted using secondary data.

The study was moderated by Board Financial Expertise and the independent variable of the was CAMELS Framework and it was measured using Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, Liquidity Management and Sensitivity to market Risks. The dependent variable was Financial Performance measured by Return on Assets. This study was controlled by firm size and firm age.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter intends to acquaint the reader with the following concepts: the concept of financial performance, the concept of CAMELS framework and the concept of board financial expertise. It further discusses the theoretical framework, and the conceptual framework.

#### **2.1 Review of Concepts**

##### **2.1.1 Concept of Financial Performance**

In theory, the concept of financial performance forms the core of strategic management and empirically, most strategy studies make use of the construct of business performance in their attempt to examine various strategy content and process issues (Al-Matari, 2014). Don Hee (2011) on the other hand defined organization performance as the analysis of a company's success compared to its profitability. Further, he added that within corporate organizations, there are three primary dimensions analyzed: financial performance, market performance and shareholder value performance.

Specialists in many fields are concerned with financial performance including strategic planners, operations, finance, legal, and organizational development (Davlearn, 2013). According to Davlearn (2013) in recent years, many organizations have attempted to manage financial performance using the balanced scorecard methodology where performance is tracked and measured in multiple dimensions such as; financial perspective, for example shareholder return, customer service perspective, social responsibility perspective for example corporate citizenship and community outreach and employee stewardship.

In management, the significance of performance is clear through the many prescriptions provided for performance enhancement (Al Manaseer *et al.*, 2012). Research dedicated to governance structures relationship with financial performance was highly dependent on accounting-based indicators. Some studies have adopted individual measurements (accounting-based or market-based measurements). The main idea behind measuring performance is to obtain information about what needs to be improved. Organizations today try to measure their overall customer service performance, and while the criteria considered vary, they usually include quality (of the product) and delivery time.

The financial performance is often measured using traditional accounting Key Performance Indicators (KPI) such as ROA, ROS, EBIT, EVA or Sales growth (Ittner & Larcker, 2007; Fraquelli & Vannoni, 2000; Crabtree & DeBusk, 2008). The advantage of these measurements is their general availability, since every profit-oriented organization produces these figures for the yearly financial reporting (Chenhall & Langfield-Smith, 2007). However, balance sheet manipulations and choices of accounting methods may also lead to values that allow only limited comparability of the financial strength of companies.

### **2.1.2 Concept of CAMELS framework.**

The CAMELS framework (capital adequacy, asset quality, management efficiency, earnings, liquidity and Sensitivity of market risk), greatly shapes the performance of bank.

#### **2.1.2.1 Capital Adequacy**

Capital adequacy is percentage ratio of a bank's primary capital to its loan and investments, used as a measure of its financial strength and stability (Amahalu, 2016) . Capital adequacy by definition is seen as a quantum of fund, which a financial

institution should have a plan to maintain in order to conduct its business in a prudent manner (Kishore & Pandey, 2005).

Capital Adequacy denotes the amount of capital, equal to or above capital requirements by the regulator. Capital adequacy defines the ability of a commercial bank concerning achieving the time obligations and added risks like operational risk, credit risk that is important for the bank to mitigate against potential losses, hence, protect the interests of the bank's account holders and other creditors in the financial sector (Bouheni, 2014)

#### **2.1.2.2 Asset Quality**

The concept of asset quality involves process of evaluating assets of an organization used in facilitating measurement of size, and level of credit risk. Asset quality is an appraisal or assessment assessing the risk associated with a specific asset that usually require interest payments. Risk advisors often evaluate the quality of such assets by allocating an arithmetical grade to the various assets contingent upon how much risk is associated with the asset. The rating naturally weakens with a drop in timely and full repayment (Muchiri, 2016).

#### **2.1.2.3 Management Efficiency**

Management efficiency' simply called 'efficiency ratios' are ratios used to determine how well assets perform to grow businesses. Asset management ratios are the key to analyzing how effectively and efficiently a business is managing its assets to produce sales. Asset management ratios are also called turnover ratios or efficiency ratios (Oghenekohwo, et al., 2018). efficiency is the ability of firms to use production factors effectively that can be measured by the ratio of Operating Income Operating Expenses (OPO). OPO is a ratio of comparison of operating expenses to operating income used to measure the bank's ability in the effectiveness of its

operational activities (Fatimah, 2014). Meanwhile, Rivai et al., (2013), according to him, OPO ratio is a comparison between operating expenses and operating income in measuring the level of efficiency and ability of banks in carrying out their operations

#### **2.1.2.4 Earnings Quality**

The concept of earnings quality has been defined in the literature in two perspectives, the decision-usefulness perspective and the economic-based perspective. From the decision- usefulness perspective, earnings quality is regarded as being high if the earning elements are useful for decision making purposes. This definition aligns with (Schipper, 2003) who argue that earnings quality can be explained from two perspectives, the contracting perspective and investment perspective.

That from the contracting perspective, low quality of earnings may result in unintentional wealth transfer. For example, firms that reward managers based on earnings may over compensate the managers if the earnings are overstated. From the investing perspective, poor quality of earnings is challenging as it can mislead investors, leading in misallocation of resources (Anaekenwa, 2019).

#### **2.1.2.5 Liquidity Management**

Liquidity is the ratio between total current assets of the firm and the total current liabilities obligation within a period of one year (Omar, 2013). It is the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution-specific nature and that which affects markets as a whole (Salim, 2016).

#### **2.1.2.6 Sensitivity of market risk**

Sensitivity to market risk is defined by regulators as the degree to which changes in interest rates, foreign exchange rates, commodity prices or equity prices can adversely

affect a bank's earnings and, in turn, its financial health. For many banks—and especially community banks—interest rate risk is the predominant market risk they face. Sensitivity to market risk reflects the degree to which changes in interest rates, foreign exchange rates, commodity prices, or equity prices can adversely affect a financial institution's earnings or capital (Galán, 2021). For most community banks, market risk primarily reflects exposure to changing interest rates. Sensitivity ratios those are related to risk and covering power of organization are defined and calculated to finalize bank's performance model because risk indicators is very important and highlighted in CAMELS model. This component was added to CAMELS method in 1996. Because of the changes in market such as, interest rate and currency ratios, banks are under risk according to the properties of their balance sheets (Papanikolaou & Wolff, 2015). For example, if a bank's foreign debts are higher than its foreign receivables; it will sustain a loss in case of increase in currency ratio. Thus, controlling the balance sheets of the banks regarding sensitivity to market risks is significant (Çağlı and Mukhtarov, 2014). In order to form CAMELS method, you evaluate each bank according to each component of CAMELS. The rates should be between 1 and 5 in which 1 refers to the highest rate whereas 5 means the lowest. In addition to this situation, many ratios related to the components of CAMELS are used in this process. In other words, banks are evaluated and getting a point for each component of CAMELS. The weighted average of all these points gives total final point of the bank (Türker Kaya, 2001)

### **2.1.3 Concept of Board Financial Expertise**

The company's act recommends that the firm's audit committee should have at least one director who has financial expertise. An independent director is classified as a financial expert if he or she: has held an executive position at a banking institution,



holds an executive position at a non-bank financial institution, holds a finance related position such as chief finance officer, accountant, treasurer or vice president finance of a non-financial firm, holds an academic position in related field or works as a hedge fund or private equity fund manager.

The benefit of having a financial expert on the audit committee is his (her) ability to monitor and oversee the accounting issues and financial reporting process. This suggests a high probability that the audit committee may curb the opportunistic earnings by managers (Krishnan and Visvanathan, 2009). Sun *et al.* (2014) points out that the audit committee's accounting-financial expertise enhances the effectiveness of the committee to monitor financial reports. Bédard *et al.* (2004) states that firms with the audit committee's financial expertise is less likely to be engaged in aggressive earnings management. Krishnan and Lee (2009) find that audit committees' accounting-financial expertise is positively related to an accounting conservatism. Badolato *et al.* (2014) found that audit committees with financial expertise are related to lower earnings management. Scholars also find that audit committee with even at least one financial experts are associated with highly accruals quality (Dhaliwal *et al.*, 2010).

Fama and Jensen (1983) argue that the board of directors has ultimate responsibility for the economic, efficient, and effective allocation and use of corporate resources. As such, the board is at the apex of the system of governance in the modern corporation. In maximizing value for shareholders, Adams and Ferreira (2007) report that the board provides two key functions: first, the monitoring and control of principal-agent incentive conflicts; and second, providing advice to the CEO and other board-level directors on how to maximize firm value. Custódio and Metzger (2014) argue more specifically that as financial sophisticates, senior finance-expert directors are able to communicate more effectively with capital markets than their nonfinancial

counterparts. Kroszner and Strahan (2001) and Güner, Malmendier, and Tate (2008), however, suggest that the appointment of board-level financial experts (in their cases, bankers) could produce misaligned incentives and reduce firm value.

Moreover, as a consequence of corporate governance guidelines desire to minimize overly risky decision making, outside directors in the United Kingdom are rarely compensated by performance-related contracts, such as stock options. For these reasons, the possibilities for board members, including professionally qualified financial experts, to extract “economic rents” and engage in “risk-shifting” activities at the expense of other stakeholders are likely to be less acute in the U.K. insurance industry.

Further Raheja (2005) notes that in complex firms (such as banks), board-level financial experts help reduce the verification costs of corporate financial information thereby promoting the efficiency and reliability of the external audit function. Therefore, through the lens of agency theory, the supervisory and advisory functions of professionally qualified financial experts on the board serve the interests of capital providers, for example, through improved stewardship and the alleviation of market information asymmetries

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## **2.2 Theoretical Perspectives.**

The following theories guided the study:

### **2.2.1 Resource Based View Theory**

Resource based view analyses and interprets resources of the organization to understand how organizations achieve sustainable superior performance. RBV focuses on difficult to imitate attributes of the firm as sources of superior performance and competitive advantage. (Barney 1986, Hamel and Prahalad 1996). Performance variance between firms depend on its possession of unique input and capabilities. (Conner 1991) RBV takes a firm specific on why organizations succeed or fail in the market place (Dicksen 1996). Resources that are valuable, rare, imitable and non-substitutable makes it possible for a firm to utilize these resources and have superior performance.

(Grant, 1991 Collis and Montgomery 1995 Wernerfelt 1984) a firm can be considered as a collection of physical resources, human resources and org resources. Valuable resources must enable a firm to do things and behave in ways that lead to high sales, low costs, high margins, add financial values to the firm. Resources are valuable when they enable a firm to conceive or implement strategies that improve its efficiency and effectiveness. RBV Helps managers understand why competencies is a firm's most important asset and appreciate how those assets can be used to improve business performance.

RBV accepts that attributes related to experiences, organization culture and competencies are critical for the success of the firm. Barney 1991 categorizes three types of resources, physical capital resources, human capital resources and organizational capital resources. Brumagim 1994 presents a hierarchy of resources with four different levels of corporate resources, production/maintenance resources considered the lowest level, admin resources, organization learning resources and strategic vision resource which is considered the most advanced /highest level.

The resource based view theory has important implications for the role of the board of directors in financial performance. The board should focus on identifying and developing human resources and capabilities such as financial expertise that will give the firm superior performance. Secondly, the board should provide an oversight to ensure that the identified resources are used effectively and efficiently for superior performance and competitive advantage.

### **2.2.2 Upper Echelon Theory**

Upper echelon theory was set forth by Hambrick Donald C and Phyllis A Mason (1984). This theory postulates that individual characteristics play a significant role in corporate level decision making. Top managers' characteristics significantly influence firms' strategic choices and eventually firm performance.

Upper echelon theory examines how executive characteristics and experiences share their perceptions, choices and actions in ways that affect a firm's outcome. (Riga-Diambeidou *et al* 2019). The UET assumes that top management characteristics can explain some external and internal decision making processes and affect company's performance (Capenter, 2004). The characteristics of values, experience, age and

education can strongly affect how managers interpret situations and how they make strategic decisions, which ultimately affects the firm's performance.

This theory is useful to this study as it explains the effects of top management characteristics, the board, on the firm's performance.

### **2.2.3 Human Capital theory**

Becker (1962) and Rosen (1976) formulated human capital theory which argues that employees have a set of skills and abilities which can be improved through training and education. Human capital is a resource.

Human capital implies the nonphysical resources in form of managerial talent as well as education, training and professional ability of workers in business. (Crook *et al* 2011). Human capital theory posits that labor is heterogeneous hence; a person's productivity reflects the differences in skill, competences, knowledge and capacities. Productivity, management characteristics and experience of top management teams can be linked to an enhanced competitive advantage and improved company performance. (Gimeo *et al* 1997). Human beings can increase their productive capacity through education and skills training.

This theory is significant since it connects board financial expertise that has been acquired through education, training and experience to financial performance of the banks.

### **2.2.4 Efficiency Structure Theory.**

Demsetz (1973) created efficiency Structure Theory. It observes that the connection between market structure and execution of any firm is characterized by a firm's proficiency. Firms with prevalent efficient administration have lower costs, hence higher benefits. Saeed and Kent (2009) pointed out this theory's classification into two

perspectives in particular: X efficiency and scale productivity speculations. X efficiency speculation implies that increasingly effective firms have lower costs, higher benefits and bigger pieces of the pie (Athanasoglou *et al.*, 2006).

This theory as per Sami (2010) specifies that a bank that work more productively than its adversaries accomplish higher advantages coming about in view of low operational costs. The Efficiency theory contends that keeping money with better administration, practices controls expenses, and draws the bank nearer to the best-practice and lower bound cost bend. The scale-proficiency theory contends that a few banks accomplish better size of activity and, in this way, lower costs (Miller *et al.*, 2005).

This theory is significant in the sense that it emphasizes that firms with effective administration have lower costs hence higher benefits.

## **2.3 Empirical Literature.**

### **2.3.1 Capital adequacy and Firm Financial Performance**

According to Archer *et al.*, (2010) capital adequacy refers to availability of reasonable capital that will safeguard the sanctity of any customer deposits held by an organization. Another definition by Olalekan & Adeyinka, (2013) suggests that capital adequacy refers to money required by an institution to hold or have in order to facilitate sound and smooth business operations over a period of time. He further asserts that availability of adequate capital is necessary to prevent a firm from failure by absorbing any possible losses.

According to Almazari and Alamri (2017) the term capital adequacy denotes the ability and competence of a firm to determine how well it addresses the risks it is faced with. It also relates to what way the firm is capable to make decisions founded on the corporate strategy. They also assert that capital adequacy is a very significant factor

especially ascertaining the prices of various products and optimization of returns from a firm's activities.

An argument by Almazari and Alamri (2017) states that the Capital Adequacy Ratio (CAR) of an organization is the most suitable metric of measuring capital adequacy. They also indicate that CAR is an important ratio of firm liquidity. This is a percentage of an organization's overall capital to the aggregate weighted risk assets. This ratio may differ from one industry to another depending on the regulations that have been put in place by the regulatory authorities. The significant pointers of capital adequacy in a firm may include asset quality, capital structure, the liquidity of a firm and the asset base (Olalekan & Adeyinka, 2013). CAR further serves as an important pointer towards a firm's management competence especially in deploying financial assets with the aim of optimizing shareholder returns. Information from studies indicates that a negative relationship is evident between huge levels of capital adequacy and profitability (Almazari & Alamri, 2017).

From the empirical reviews of capital adequacy, financial performance nexus, Berger and Bouwman (2013) state that there is a relationship and significant impact on capital amplexness on global bank gainfulness basing on a study conducted from various banking institutions in the USA. Ogboi and Unuafe (2013) used a sample of 6 Nigerian based commercial banks aimed at determining the impact of capital adequacy on their financial performance for 2004 – 2009. The study found that the banks' money related execution was emphatically affected by the capital adequacy. However, during the period of study, the loans and advances affected the banks' benefit negatively.

Chinada (2015) examined the effect of least capital prerequisites on Zimbabwean banks performance and to break down the connection concerning the banking institutions least

capital necessities and the performance. The investigation discovered that Minimum capital prerequisite enables banking institutions to redeem benefits as meeting the base capital diminishes the probabilities of bank misfortunes, as short-term borrowing will not compel the institutions, which is commonly at an astonishing cost. A bank with sufficient capital was found to have a competitive advantage in its operational market as it can offer more items and this makes it more focused on its operations; hence, it can capture a bigger market share.

Ali (2016) researched the critical determinants of productivity on account of Jordanian banks. A piece of board information (2005-2014) was utilized to accomplish the research, as well as ROE and ROA used as banks' productivity and profits estimation. The results demonstrated that a linear relationship existed as far as the capital, capital adequacy, and banks' productivity was concerned, while, a reverse relationship for the variables assets quality and profitability of the bank was documented.

Murkomen (2013) found out that the core capital to total risk-weighted assets ratio has a strong and positive connection with the operating efficiency in a study carried out on Kenyan commercial banks to determine the impacts of capital requirement on operating efficiency. Nekesa (2017) found out that capital sufficiency contributes decidedly to an organization's financial performance basing on a study carried out on firms listed on the Kenyan Nairobi Securities Exchange.

### **2.3.2 Asset quality and Firm Financial Performance**

On Asset Quality (AQ), Kadioglu *et al.* (2017) in Turkey considered the effect of AQ on bank performance. The study focused on 55 banks from 2005 to 2016. Bank profitability was negatively affected by any increase in provision for NPL to total loans while a reduction in the provision for NPL as a ratio of total loans impacted positively



on bank profitability. Existing empirical literature shows a significant negative relationship between NPL and bank profitability.

Kadioglu *et al.* (2017) explained that higher NPL signifies lower AQ which translates into lower ROA and ROE. Using a two-way fixed effect panel regression, the findings of the study showed a significant negative relationship between AQ measured by NPL and the ROA and ROE as measures for bank profitability.

Amuakwa-Mensah and Boakye-Adjei (2015) noted that bank specific variables (bank size, loan growth and net interest margin) and macroeconomic variables (real GDP per capita growth and real effective interest rates) have significant effects on the AQ of banks. The impact of bank size on NPL yielded mixed results. The negative relationship between bank size and NPL is explained by the existence of better risk management strategies in larger banks that mostly results in very superior loan portfolios as compared to that of smaller banks (Hu *et al.*, 2006). Studies by (Rajan and Dhal, 2003; Sinkey and Greenwalt, 1991) found positive relationships between NPL and performance emphasize that banks that value profitability at the expense of the costs of high risk are more prone to incur higher NPL especially in periods of economic recessions.

In assessing AQ of banks in Nigeria, a research by Lucky and Andrew (2015) concludes that the relationship between AQ and profitability is significant. Return on investment was modeled as a function of bank specific variables (percentage of NPL to total loans, percentage of loan loss to total assets, percentage of NPL to customer deposits and percentage of loan loss to total assets). The findings of Lucky and Andrew (2015) were similar to Adeolu (2014). Managing credit risk is essential for determining profitability of banks. Liquidity positions of banks are threatened if loans, the riskiest of all assets,

are not managed to safeguard the interest of investors. As shown from the litany of literature, extant research (Kadioglu *et al.*, 2017; Ozkan *et al.*, 2017; Lucky and Andrew, 2015; Adeolu, 2014) on AQ does not exist in numbers.

### **2.3.3 Management Efficiency and Firm Financial Performance**

Tyas & Wuryani, (2021) conducted a study on effect of efficiency ratios, non-performing loans, and profitability on the capital adequacy ratio in Islamic Commercial Banks in Indonesia 2014-2018. This research is a quantitative study with secondary data from financial reports. Purposive sampling is a sampling technique use in this study so that there are 14 samples of Islamic commercial banks during the 2014-2018 period. The data analysis used is multiple linear regression analysis with the SPSS application. The results obtained by two dependent variables, the efficiency ratio and non-performing loans have an influence on the capital adequacy ratio. Meanwhile, profitability partially has no effect on the capital adequacy ratio

Santosuosso (2014) examines how proxies of efficiency can help investors in exploring firm profitability, stock market value and operational cash flow using company accounting information on the basis of the multiple regression model. On a sample of 215 non-financial firms listed on the Italian Stock Exchange between 2004 and 2013, a positive correlation was found between several turnover ratios used as proxies of efficiency and measures of firm profitability that are more closely related to operating activities such as EBITDA to assets ratio. Similarly, a positive correlation was revealed when operational cash flow was examined, whilst no significant associations between proxies of efficiency and stock market indicators were found.

Aktaş, & Seyfettin (2015) examined the relationship between the efficiency ratios and stock prices of insurance firms, whose stocks are publicly traded in Borsa Istanbul. The study is performed on quarterly data set. The sample period covers 2005Q1 and 2012Q4. Taking three sets of efficiency ratios, which are namely cost, revenue and profit efficiency, as proxy, a regression analysis was run against stock prices. findings

suggest that all of employed models confirm statistically significant relationships between the efficiency ratios and stock prices.

Sunjoko and Arilyn (2016) found efficiency ratio has a positive and significant association with profitability when they examined a sample of pharmaceutical companies in Indonesia between 2007 and 2013. Santosuosso (2014) examines the connection between efficiency, firm profitability, stock market value and operational cash flow. By analyzing the data of 215 Italian companies for 10 years between 2004 and 2013. He found a positive correlation between efficiency ratios and each of profitability and operational cash flow, but not with stock market indicators. Avramov et al. (2006) found that liquidity facilitates efficiency, in the sense that the market's capacity to accommodate order flow is larger during periods when the market is more liquid. Popova et al. (2017) found a significant correlation between efficiency ratio (asset turnover) and Russian companies' debt levels. Other study by Kalaivani and Jothi (2017) conclude that the efficiency of working capital management is influenced by the Debtor Turnover Ratio, Inventory Turnover Ratio and Current Asset Turnover Ratio.

Itumo (2013) studied the alliance between efficiency and financial performance in Kenyan commercial banks. The review employed a descriptive statistic for a sample period of 5 consecutive years from 2007 - 2012. The study revealed that the efficiency ratio dropped from 2008 to 2012, which means that banks were generating lower-income compare to their operating expenditures. However, the correlation between bank efficiency and financial performance was positive. This got confirmed by Kaneza (2016). The study disclosed that management efficiency is positively associated with performance. It means that one unit increase in management efficiency would lead to an increase in the performance of commercial banks quoted at NSE at a certain point. Karemera (2013) investigated the correlation between the regulation and financial

performance of commercial banks in Rwanda. The study chose ten commercial banks in which eight of them were able to participate in this investigation. The findings showed that both management efficiency and liquidity management do not explain the banks' performance

#### **2.3.4 Earnings quality and Firm Financial Performance**

Earnings quality provides information about financial misstatements and contributes in increasing investor's confidence about earnings information (Cheng, 2019). Earnings quality is used to predict future company's returns by providing information about the features of a firms' financial performance that is relevant to certain decision making.

Companies that pay out dividends are valued significantly higher than companies that sell equity (Martowidjojo, 2019). High earnings quality increases the companies' performance of Jordanian Industrial public shareholding companies where ROA, ROE and EPS indicates company's performance (Saleh, 2020).

Findings from prior studies in earnings quality and firm financial performance are mixed, while some found positive, others found negative, and others found none. For example, Klapper and Love (2002) examined the relationship between corporate governance and financial performance employing Tobin's Q as a proxy for financial performance. The study uses data obtained from the Credit Lyonnais' Security Asia (CLSA) in the form of implementation of corporate governance ranking for 495 companies in 25 countries, the companies' performance in the study was measured using Tobin's Q as a measure market value and return on assets as a measure of operational performance of the company. The study found appositve relationship between corporate governance and corporate financial performance.

Further, Al-Khouri, Magableh and Aldamen (2004) examined the relationship of managerial holdings with Tobin's Q and Research and development (R& D) expenditure of Japanese firms over the period 2000- 2003. The study revealed negative relationship between Tobin's Q and R& D, and that Japanese managers engaged in pursuing non-value- maximizing objectives. Tahir and Razali (2011) examined the relation between enterprise risk management and firm value in Malaysian public listed companies with Tobin's Q as the measure of firm value. The study was based on 2007 year for 528 companies. The study found that enterprise risk management is positively related to firm value but it is not significant.

Building on Tahir *et al.* (2011) work, Georgeta and Stefan (2014) examined the relationship between financial intermediaries' ownership and firm value in Romania for a period of 2007-2011, using companies listed on the Bucharest Stock Exchange (BSE) using Tobin's Q as a proxy measure firm financial performance of the companies listed in Romania. The study found that there exists a positive influence of Romanian financial investment on firm value but up to an ownership threshold of 2.7%, after which point the influence becomes negative. The study also found positive influence of shareholding of all categories of financial intermediaries on firm value when considering the ownership of the investment funds and financial investment services companies but up to an ownership threshold of 50.3%.

Similarly, Wiyadi, Noer, Rina and Ichwani (2015) investigated the impact of information asymmetry, firm size, leverage, and profitability and employee stock ownership on earnings management. The study employed 191 companies listed in the Jakarta Islamic Index and 226 companies listed in LQ45 for the period of 2004-2013. The study findings indicated that information asymmetry had positive effect on the earnings management in both indexes. That the employee stock ownership had a

positive influence on the earnings management. The study seems to support agency theory that management could manipulate earnings if there is more information gap between principal and agent in the management of companies.

From Indonesian market, Sabrin, Sarita, Takdir and Sujono (2016) examined the effect of firm performance (profitability) on firm value. The study employed secondary data obtained from manufacturing companies listed on the Indonesia Stock Exchange for a period of 6 years 2009-2014. The study found that profitability as a measure of firm performance using Tobin's Q has positive effect on firm value. The study further found that dividend payment as a sign of profitability increases the firm share price.

Tayebe, Jamal and Hamid (2016) examined the effect of firm size and financial leverage in the relationship between cost management and the relevance of accounting information on the companies listed on the Tehran Stock Exchange. The study used 101 companies for period, 2004- 2013 with Ohlson's pattern in which the relevance of earnings per share and book value per share were examined using market value per share. The study found that cost management significantly and positively affected share value. Also that cost management negatively influenced share value.

Furthermore, Sucuahi and Cambarihan (2016) examined the impact of profitability on firm value of diversified companies in the Philippines. The main objective of the study was to determine if there is significant influence between the company's profile such as industry, company age and its profitability and the firm value using Tobin's Q model. The study employed 86 diversified companies listed on the Philippines Stock Exchange. The result from the study revealed that three factors influence value of the firm using the Tobin's Q model. That only profitability showed significant positive impact on the firm's value. The study concluded that Tobin's Q is considered as one of

the best predictor of market correction and it can also explain the majority of the investment variability.

However, Akben-Selcuk (2016) examined the likely future performance of a firm based on the current performance, the study investigated factors affecting firm competitiveness in the emerging market in Turkey. Tobin' Q was used in measuring company's financial performance of firms listed on Borsa Istanbul for a period of 9 years (2005-2014). Tobin's Q ratio revealed that firm's performance based on good return on assets utilization was positively related to firm size, sales, liquidity and growth. Furthermore, the study revealed that gross profit margin is positively related to size and intentional sales and also negatively related to leverage and research and development expenditure.

More so, ( Hossein *et all*, 2017) examined the impact of the management performance evaluation methods on the quality in accounting, considered firm performance. The study adopts Tobin's Q to measure the firm performance using 112 companies in Tehran Stock Exchange during the period of 4 years (2000-2013). The study found that earnings quality has a positive relation to management abilities using Tobin's Q. The results of all these empirical studies revealed inconsistencies and the debate of the impact of earnings quality on firm financial performance is still unresolved. Consequently, there exists a paucity of literature and a researchable gap relating earnings quality and firm financial performance, which is the cause of this study.

Hassan (2014) investigated firm attributes and earnings quality of listed oil and gas companies in Nigeria for the period of 2007-2011. The listed oil and gas firms are nine (9) in numbers out of which a sample of seven (7) were used for the study. Firm attributes as the independent variable was proxy with firm size, leverage, institutional

ownership, profitability, liquidity and firm growth, while the residuals from the modified Jones model was used to proxy earnings quality. The study adopts multiple panel regression techniques and data were collected from secondary source through the annual reports and accounts of the firms. The findings revealed that leverage, liquidity and firm growth has a significant positive impact on earnings quality while firm size, institutional ownership and profitability have a significant but negative influence on earnings quality of listed oil and gas companies in Nigeria. It is recommended among others that the oil and gas companies may choose to go for more debt especially where the interest rate is considerably low and also increase their liquidity asset and turnover as it has been found empirically to enhance the quality of the firms reported earnings.

However, several studies discussed the relationship between earnings quality and performance, such as Ball and Shivakumar (2005), Dechow (1994), Dichev *et al.* (2013), Burgstahler *et al.* (2006), Dechow *et al.* (2010), Davis-Friday *et al.* (2006), and Martowidjojo *et al.* (2019). They noted that earnings quality and the performance are important issues with environmental uncertainty that affects the business environment. Martowidjojo *et al.* (2019) discussed that high-earnings quality decreases rather than increasing the market values of equity, but companies that pay out dividends are valued significantly higher, at the same time the companies that issue equity are valued lower. Machdar *et al.* (2017) also discussed that high accounting reservation will increase the relevance of accounting information, and this will improve earnings quality. They found that operating performance is positively affected by earnings quality, and negatively affected by real earnings management.

Dang *et al.* (2020), Aguom *et al.* (2019) and Aguguom and Salawu (2018) documented that earnings quality is highly positively associated with companies' book value, and this refers to the relevance of information disclosure which enhances earnings quality,



as well as credibility of reported book value. Chan *et al.* (2006) discussed that stock returns are positively and negatively affected by earnings quality and earnings management, respectively. This means that high earnings quality and low-earnings management will improve stock returns, and thus earnings quality is negatively associated with earnings management. Their results showed that high earnings quality reduces the conflict of interest practices in the companies and thus the stock returns improve. Additionally, Lee (2019) added that non-operating earnings quality affects the market returns of Taiwan's companies. However, Wijesinghea and Kehelwalatennab (2017) found no effect of earnings quality on the shares returns of manufacturing companies.

### **2.3.5 Liquidity and Financial Performance**

Liquidity is the ratio between total current assets of the firm and the total current liabilities obligations within a period of one year. Very high liquidity ratio may suggest that a firm has a lot of cash but lacks the managerial acumen to put the resources at work while very low liquidity ratio means that the firm may struggle to meet its short term obligations as and when they fall due (Omar, 2013).

The most liquid asset is cash, both at hand and in the bank, Chipa and Wamiori (2014). In the same vein, liquidity is a technical term referring to the ability of a firm to pay off its liabilities, whose re-payment period is less than twelve months, by using its liquid assets at its disposal and not by liquidating its fixed assets. A firm may have a huge volume of Equity Capital but still suffer from liquidity problems due to mismatch of assets and liabilities maturity timelines (Olajide, Funmi, & Olayemi, 2017).

Empirical research indicates that there is no consensus on the direction and degree of influence that liquidity has on the financial performance of banks. Muriithi (2016) did

a study to determine the effect of the liquidity risk on the financial performance of the 43 commercial banks operating in Kenya between 2005 and 2014. Liquidity was measured as net stable funding ratio and as liquidity coverage ratio. The study concluded that net stable funding was negatively related to the bank financial performance. However, the study showed that change in liquidity coverage ratio did not have any corresponding change on the financial performance. Nevertheless, the overall effect of liquidity on the financial performance was registered as negative.

Alomari and Azzam (2017) found that liquidity was inversely related to ROA. The study population included the 24 listed insurance firms operating in Jordan in between 2008 to 2014. The other study variables were inflation, gross domestic output, underwriting risk and leverage. Kinyua (2018) examined the micro factors that play a role in influencing the profitability of insurance firms in Kenya. The study was motivated by the fact that the insurance industry in Kenya has over the years experienced numerous challenges due to the significant changes in the insurance industry in Kenya. The research utilized a descriptive research design. A census was conducted to sample insurance firms in Kenya that are licensed to operate. From the census, the study targeted 6 listed insurance firms. Regression analysis was used to ascertain the relationship between the micro factors and financial performance. The micro factors that the research focused on were firm size, liquidity, insurance claims and retention ratio. The analysis of the data was done with the STATA software. The findings from the analysis indicated that liquidity had no significant effect on the profitability of the targeted insurance firms. Besides, firm size had a negative and significant effect on the profitability of the insurance firms in Kenya. On the other hand, claim ratio and retention ratio had a negative and insignificant effect on the profitability of the listed insurance firms in Kenya. It was therefore deemed utmost necessary for

insurance firms in Kenya to evaluate their strategies on working Equity Capital management, market penetration and asset accumulation. The current study establishes if liquidity elicits a significant effect on the financial performance of commercial banks in Kenya.

Patrick (2018) delved into the effect of liquidity management on the performance of Nigerian insurance firms. The period of focus was between 2003 and 2012. The independent variables in the study were liquidity ratio, Equity Capital, working Equity Capital, investment, firm size and under-writing risk. The dependent variable was firm performance. The study utilized panel data to address the research's objectives. The Hausman test indicated that the random effect model was the most appropriate to test the hypotheses. The findings from the random effect model indicated that liquidity management does not significantly influence the performance of Nigerian insurance firms. On the other hand, both working Equity Capital and investment positively influence insurance firms' performance. It appears that the insurance firms are less involved with liquid cash hence their focus needs to be on Equity Capital which has the potential to improve their performance. The current study however focuses on liquidity as opposed to liquidity management.

Further, Derbali & Jamel (2014) examined the influence of firm characteristics that influence the profitability of insurance firms in Tunisia. The independent variables that the study focused on were liquidity, leverage, firm size and age, risk and growth. Conversely, the dependent variable was profitability proxied by ROA. The period of focus was between 2005 to 2015. The findings indicated that the key determinants of the profitability of Tunisian insurance firms were size, age and growth. However, liquidity and leverage had no effect on the profitability of the Tunisian Insurance firms.

Review of the relationship of bank liquidity and financial performance of bank also reveal inconclusive findings in the study findings. A Pakistan based study on Habib bank limited was conducted for the period 2008-2014 by Rizwan & Mutahhar (2016) found out that there is a significant positive relationship between the banks' liquidity and profitability. Oblior (2013) studied 3 Nigerian banks to examine the impacts of liquidity management on their profitability. The study used proxies representing profitability (profit after tax) and liquidity management (bills and certificates, bank balances and treasury and cash and short-term funds). The study concluded a positive effect of bank liquidity on financial performance. Muriithi (2017) examined the impacts of financial performance and liquidity risk on their operations. The study results were that short term profitability of the banks had a negative relationship with liquidity risk. However, the study found no significant relationship between long term financial profitability and bank liquidity levels. Nonetheless, the study's general finding was that liquidity risk hurts commercial banks financial performance.

### **2.3.6 Sensitivity of Market Risk and Firm Financial Performance**

Al-abadallat (2019) aimed at assessing the performance of the Jordanian banks using Camels model for the period (2003 to 2017), and identifying the impact of the components of Camels model on the banks' performance measured by returns on the assets, returns on equity, and net income. The study used a sample was the largest eleven banks of the Jordanian banks depending on capital and asset of the banks, and to test the hypotheses of the study by testing multiple linear regression using E-Views software. The study found that sensitivity to risk positively and significant effect on performance (ROA).

Ghasempour and Salami (2016) evaluate and compare performance of Iranian banks based on the CAMELS rating system. For this purpose, after studying the related

literature, factors relating to efficiency and soundness were identified and used to assess banks; these were Capital Adequacy, Asset Quality, Management Capability, Earnings, Liquidity, and Sensitivity to Market Risk

Yuksel, et al., (2015) demonstrated the relationship between CAMELS ratios and credit ratings of deposit banks in Turkey. Annual data was used for the period between 2004 and 2014 in this study. Moreover, 20 deposit banks of Turkey were analyzed and 21 different ratios of CAMELS components were used. In addition to that, credit ratings of these banks were provided from Moody's corporation or annual activity reports of the banks. After that, we created multi nominal logistic regression analysis in order to illustrate the relationship. The major finding in this study is that three components (Asset Quality, Management Quality, and Sensitivity to Market Risk) of CAMELS have effects on credit ratings whereas the ratios related to Capital Adequacy and Earnings are not effective.

Rostami (2015) studied camels' analysis in banking industry, in this study some important ratios are chosen and calculated to evaluate bank's performance. Data which is used in this study is gathered from annual financial reports of an Iranian bank. Then data is compared with other bank's ratios and reports. Certainly, the trends of calculations and relevant figures show important points for managers and also, CAMELS rating can be an efficient tool to manage and control and decide in management accounting view. Study showed sensitivity to market risk had positive effect on financial performance.

Muriithi et al., (2016) assessed the effect of market risk on financial performance of commercial banks in Kenya. The study covered the period between year 2005 and 2014. Market risk was measured by degree of financial leverage, interest rate risk and foreign

exchange exposure while financial performance was measured by return on equity. The study used the balance sheets components and financial ratios for 43 registered commercial banks in Kenya. Panel data techniques of random effects, fixed effects estimation and generalized method of moments (GMM) were used to purge time-invariant unobserved firm specific effects and to mitigate potential endogeneity problems. The pairwise correlations between the variables were carried out. F- test was used to determine the significance of the regression while the coefficient of determination, within and between R<sup>2</sup>, were used to determine how much variation in dependent variable is explained by independent variables. From the results financial leverage, interest rate and foreign exchange exposure have negative and significant relationship with bank profitability.

### **2.3.7 Moderating Role of Board Financial Expertise**

Financial experts can provide a better understanding of financial information (Kirkpatrick, 2009), provide valuable financial advice to management (Francis *et al.*, 2009), and to some extent help firms access external funds (Guner *et al.*, 2008). Those functions could be more important during the financial crisis. Fernandes and Fich (2009) find that financial expertise of banks' outside directors is positively related to the stock performance of financial institutions during the current crisis. Thus, the second set of testing variables is financial expertise of directors.

In the literature, there are various studies documenting the importance of board members' skills in executing a successful business. A clear part of the literature (Gouiaa & Zéghal, 2013; Johl, Kaur, & Cooper, 2015; Yusoff & Amrst rong, 2012) distinctly considered that directors' competencies, qualified and experienced directors' or directors accounting expertise are board characteristics and investigated their relationship with financial performance.

Rad *et al.* (2012) investigated whether companies that have directors who are professional members of the Institute of Directors (IOD) perform better than companies that lack such directors. Their study revealed that the more educated and professional the board members are, the more positively the business performance is affected. A broad study by Gouiaa and Zéghal (2013) conducted for Canadian firms, empirically shows that some board characteristics such as ‘qualified and experienced directors’ tend to reduce the average cost of capital. In order to find the ‘effective board characteristics’ in Malaysia, Yusoff and Amrstrong (2012) conducted a survey based on a qualitative approach involving two stages of the Delphi Technique. They found that financial competencies received the highest responses, followed by corporate planning, business forecasting, legal, risk management, marketing, human resource and international business. Similarly, for Malaysia, Johl *et al.* (2015) considered ‘directors’ accounting expertise’ to be among the board characteristics and, in their study conducted in Malaysia for 700 public listed firms for the year 2009, they found that board accounting/financial expertise are positively associated with firm performance (expressed by ROA)

Erin *et al.* (2019) found that the higher the proportion of board members holding degrees in finance-related fields, the higher the performance. Along the same line, Arumona *et al.* (2019); Harjoto *et al.* (2019); Swarnodeep and Aurelie (2019); Saidu (2019); and Aluoch *et al.* (2020) found a positive impact of director financial expertise on firm performance.

#### **2.4 Summary and Gaps to be filled by the study.**

Ogbi and Unuafe(2013), Chinada (2015), Ali(2016), Murkomen (2013) did studies on Capital Adequacy and its effect on the financial performance of commercial banks, their findings indicated that minimum capital diminishes probabilities of bank misfortunes

as short term borrowing will not compel the institutions. Banks with sufficient capital has more competitive advantage in the market and can offer more items hence capturing bigger market share hence good financial performance.

Sunash, Chitra and Badastani(2016), Echekeba, Chinedu and Ezu(2014) used CAMELS ranking to evaluate and compare performance of Islamic Banks found that Capital Adequacy, Asset Quality, Management Efficiency and Earnings Quality did not influence financial performance while liquidity significantly influenced financial performance.

There, however, lacks consensus among empirical studies on the effect of CAMELS Framework on financial performance of commercial banks. Therefore this study introduced a moderating variable, Board Financial Expertise, to explain the independent and dependent variables. Due to world wide corporate governance failures and accounting scandals, interest has grown in studying the roles and responsibilities of board of directors in the financial performance of a firm. Upper Echelon theory explains how executive characteristics and experiences shape their perceptions, choices and actions in ways that affect the firm's performance.

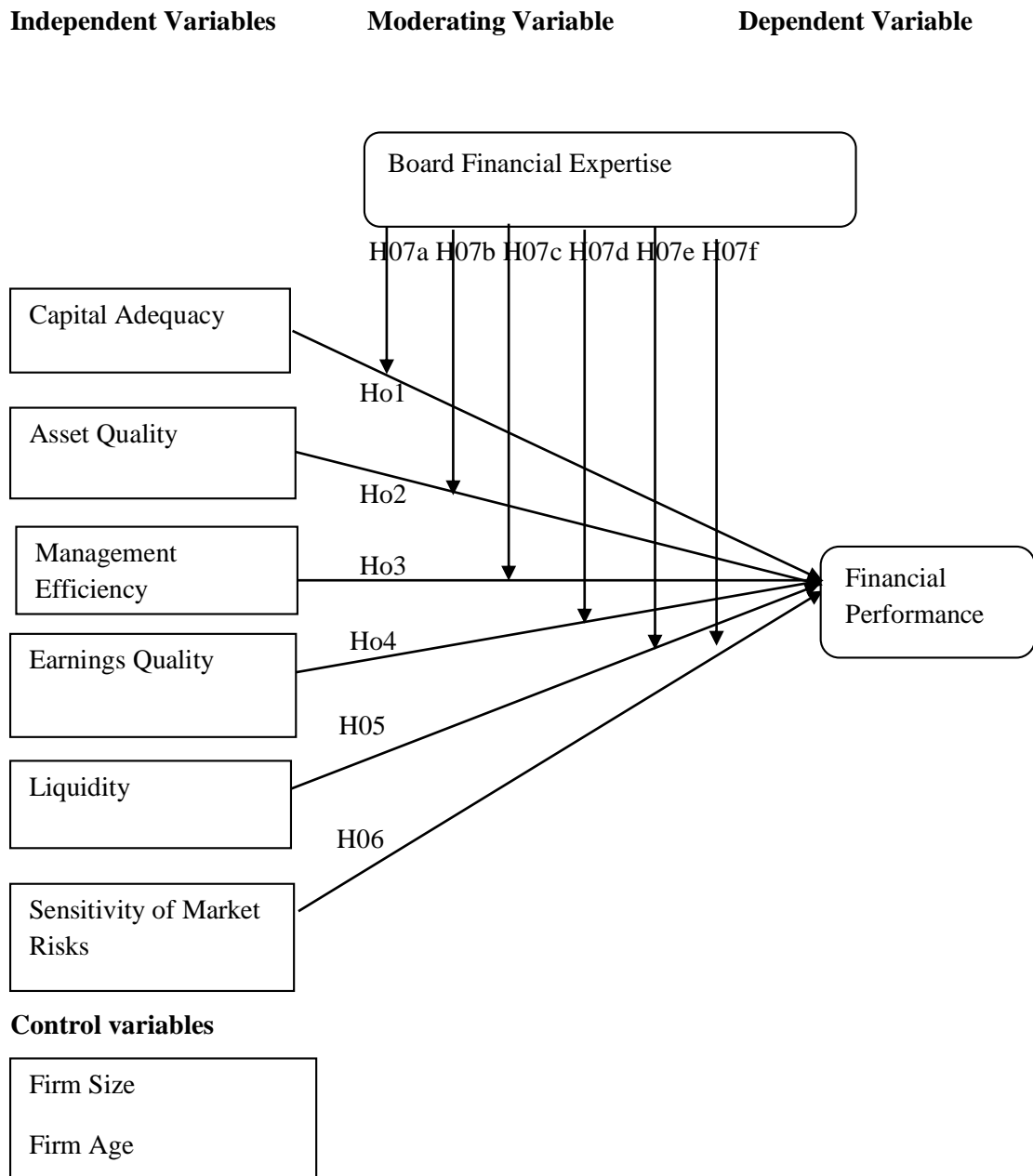
Studies have shown that financial experts play a role in performance of banks by ensuring transparency, integrity and accountability on corporate issues. Johl *et al*(2015). Garcia-Sanchez(2017) found that Financial Experts in Board led to enhanced corporate governance. Erin *et al*(2019), Arumona *et al*(2019), Auriel *et al*(2019) found a positive impact of board financial expert on firm performance. This study therefore aims to fill a gap by finding the moderating effect of Board Financial Expertise on CAMELS Framework and Financial Performance of Commercial Banks in Kenya.



## 2.5 Conceptual Framework

The following is a framework that diagrammatically represent the Moderating Effect of Board Financial Expertise on CAMELS Framework and Financial Performance of Commercial Banks in Kenya.

### Conceptual Framework



**Figure 2. 1: Conceptual framework**

Source (Researcher, 2022)

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter explains the research study information. It highlights the following elements: research design, target population, sampling design, inclusion and exclusion, data collection instruments, measurement of variables, data analysis and presentation, detecting econometric problems, limitations of the study and ethical considerations.

#### **3.2 Research Design**

Research design is the general plan of how one goes about answering the research questions. It is important to highlight the two main methods when investigating and collecting data. Quantitative and qualitative method. A quantitative approach is strongly linked to deductive testing of theories through hypotheses, while a qualitative approach to research generally is concerned with inductive testing (Saunders *et al.*, 2003). The main focus of this study was quantitative.

This study used a combination of explanatory and longitudinal research design, explanatory because it examined the effect of naturally occurring treatment after it has occurred and because it also tries to verify formulated hypothesis that refer to the present situation in order to elucidate it (Bechhofer and Paterson, 2008).. and longitudinal because the correlation study repeated observations of the same items over a long period of time. It involves tracking changes over time on a broad range of population members.

### **3.3 Study Area and Target Population**

The study targeted all commercial banks in Kenya, there are 42 commercial banks in Kenya (Central Bank of Kenya). The study was carried between the year 2010 to 2020 and each bank was analyzed annually.

#### **3.3.1 Inclusion and Exclusion**

From the target population of 42 commercial banks in Kenya, the study only selected commercial banks that have been consistent from 2010 to 2020, to avoid missing information and to deal with balanced data, the sample were 29 commercial banks, hence giving 290 years of observation.

### **3.4 Data Collection Instruments and Procedure.**

#### **3.4.1 Data Collection Instruments**

The data collection instrument used in this study was document analysis guide. The study was conducted using secondary sources, which was achieved by analyzing the content of financial reports of selected commercial banks in Kenya registered with Central Bank of Kenya. This was suitable for this study because all the audited financial information about the banks were readily available for the public as required by the Central Bank of Kenya. According to Oso and Onen (2009), document analysis is an instrument for collecting secondary information. Document analysis was used because data being collected is secondary in nature. Corbetta (2003) identified a number of advantages of the documents over other research methods. It is a non-reactive technique where the information given in a document is not subject to a possible distortion as a result of the interaction between the researcher and the respondent. However, documents may have some limitations in terms of the accuracy and completeness of the data (Patton, 2002).

### 3.5 Measurement of Variables

#### 3.5.1 Dependent variable: Financial Performance.

Financial performance used ROE and was measured by Earnings after Tax (EAT) over total shareholders' equity. This measure was used by other researchers including but not limited to (Chipa & Wamiori, 2014; Onsongo, 2015).

#### 3.5.2 Independent Variables

##### 3.5.2.1 Capital Adequacy

Banks' capital adequacy is measured as a percentage of a bank's risk weighted exposure; also known as capital to risk- weighted assets ratio (CAR). (Djankov, 2002)

$$CAR \text{ is calculated as; } = \frac{\textit{Tier One Capital} + \textit{Tier Two capital Risk}}{\textit{Weighted Assets}} \times 100$$

##### 3.5.2.2 Asset Quality

Asset quality was measured using net non-performing assets to total assets. It indicates how much of the total portfolio has been provided for but not charged off and is used as a measure of bank's asset quality and risk. Given a similar charge-off policy the higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio. (Harada, 2011)

##### 3.5.2.3 Management Efficiency

Management theoreticians agree that efficiency is a ratio of effect achieved to costs. But authors differ in their views upon appropriate managerial effects. In spite of that some researchers suggest measuring managerial efficiency as the ratio of additional profit company from a decision to the cost of the decision (Gorshkova, 2003, in Russian; Egorshin, 2008, in Russian; Vasilyev, Parachina, Ushvitsky, 2006, in Russian). The study used Operating Income over Operating Expenses (OPO) ratio of

comparison of operating expenses to operating income used to measure the bank's ability in the effectiveness of its operational activities (Fatimah, 2014).

#### 3.5.2.4 Earnings Quality

The study adopted the accounting-based earnings attribute (Earnings Smoothness) instead of market-based accounting attributes because the former is associated with how a company's cash flows from operations have transformed into reported earnings in line with this study. (Dechow *et al.*, 2010; Francis *et al.*, 2004; Walker, 2013). The study measures earnings smoothness as the percentage of the firm-level standard deviation of earnings and the standard deviation of the operating cash flow as used in the Gaio & Raposo (2011) study. The study measured earnings smoothness using the following.

$$ESMOTH = \frac{\sigma\left(\frac{NIBE_{it}}{TA_{it}}\right)}{\sigma\left(\frac{CFO_{it}}{TA_{it}}\right)}$$

Where:  $NIBE_{it}$  = the firm i's net income before extraordinary items in year  $t$   $CFO_{it}$  = cash flow from operation of firm i in year  $t$ .  $TA_{it-1}$  = cash total asset of firm i in year  $t - 1$  Value  $< 1$  implies greater variability in operating cash flows than in earnings, meaning the use of accruals to smooth earnings. Therefore, a higher value of smooth indicates less earnings smoothness. Since smoothness as desirable attribute of earnings, and therefore lower earnings smoothness implies poorer earnings quality (Leuz *et al.*, 2003; Gaio *et al.*, 2011)

#### 3.5.2.5 Liquidity

Liquidity was measured using current ratio which simply compares all liquid assets with all current liabilities. The current ratio is calculated by dividing current assets by current liabilities (Khidmat & Rehman, 2014)

### **3.5.2.6 Sensitivity to market Risk**

Earnings and capital of financial institutions can be adversely affected by changes in exchange rate, interest rate, equity price or commodity price. Many financial institutions consider changes in interest rates as market risk. Total securities to total assets= Total securities/Total assets.

## **3.6 Moderating variable and Control Variables**

### **3.6.1 Board Financial Expertise**

The variable of board financial expertise represents the number of financial experts on the board. According to (Charles, 1999) director's financial expertise is assessed in two levels of analysis: at the individual level where financial expertise is assessed based on education background and career history and at firm level where expertise as measured as the average individual expertise of board members. (Satirenjit, 2015) Found that board financial expertise is positively related to firm performance.

Board financial expertise was measured as: for each board member, code 0 for no financial or management education, code 1 for management education only, code 2 for financial experience only, code 3 for both management education and financial experience (Jeanjean, 2008). Financial experience was given more weight on the assumption that experience overtakes training and qualifications as a career progresses. This is inconsistent with (Gurner, 2008) who ignores education in the definition of financial expertise basing the concept on directors' previous employment alone. The study calculated financial experts as the percentage of financial experts over the board size. (Minton & Williamson, 2014)

### **3.6.2 Control Variable**

#### **3.6.2.1 Firm size**

Firm size (SIZE) was measured by the logarithm of total assets. Compared with smaller firms, larger firms tend to be more mature, have higher free cash flows, and are more likely to pay higher dividends. Thus, a positive relationship between firm size and dividends is expected (Thanatawee, 2013).

#### **3.6.2.2 Firm age**

Firm age was measured as natural log of the number of years the firm has been in operation (Tarus, 2016).

**Table 3. 1: Measurement of variables**

<b>Variables</b>	<b>Indicators</b>	<b>Measurement of variables</b>	<b>References (authors)</b>
<b>Dependent Variables</b>			
Financial performance	ROA	Earnings before Interest and Tax (EBIT) over Total Assets	(Hussainey <i>et al.</i> 2011)
<b>Independent Variables</b>			
Capital Adequacy	CA	measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures	Djankov and Murrell (2002).
Asset quality	AQ	net NPAs to total assets	Harada and Nguyen (2011) and Khan (2006)
Management efficiency	ME	Operating income over operating expenses	Fatimah, 2014
Earning quality	EQ	measured based on number of shares held by executive directors over total shares outstanding	(Noradiva <i>et al.</i> , 2016)
Liquidity	LIQ	current ratio is calculated by dividing current assets by current liabilities	(Khidmat & Rehman, 2014)
Sensitivity to market Risk	SMR	Total securities over Total assets.	(Khidmat & Rehman, 2014)
<b>Moderator Variable</b>			
Financial Experts	FE	Financial experts is calculated as the percentage of financial experts over the board size	(Minton & Williamson, 2014)
<b>Control Variables</b>			
Firm Size	FS	Natural log of total assets	Thanatawee (2013)
Firm Age	FA	Natural log of the number of years the firm has been in incorporation	(Tarus, 2016)

### 3.7 Data Analysis and Presentation

Data processing starts with data preparation, coding, editing and cleaning. Both descriptive and inferential statistics were used to analyze data.



### **3.7.1 Descriptive statistics.**

Descriptive statistics was used to examine location of data, for example, where data tend to fall as measured by the mean and variability of data, for instance, how spread out data are, as measured by the standard deviation.

### **3.7.2 Inferential statistics.**

Inferential statistics are closely tied to the logic of hypothesis testing discussed. Inferential statistics included Pearson Correlation and multiple regression analysis. Pearson correlation assumes the data is linear, and shows the relationship/association between the dependent variable and independent variable whereas mediated regression shows the extent of the effect of the independent variables on dependent variable.

This data was first analyzed for correlation using coefficient of correlation  $r$  for association and coefficient of determination  $R^2$  to establish the extent to which firm characteristics and financial performance relate. The liner external values of -1 and 1 indicate a perfectly liner relationship where a change in one variable is accompanied by a perfectly consistent change in the other. A coefficient of zero represent no liner relationship. When the value is in between 0 and +1/-1, there is a relationship but points do not fall on a line.

Hierarchical regression model was used to check for direct effect and moderating effect of the independent variables and the moderating variables on financial performance of commercial banks in Kenya using ordinary least squares.

### **3.8 Panel Unit Root Test**

A panel data framework is used to test the hypotheses. Panel data, as noted by Hsiao (1986), has several distinct advantages: it provides more degrees of freedom, increases variations in the data and thereby reduces the chances of multicollinearity, and makes

it possible to control for fixed effects, panel data have the strength of accommodating more observations hence increases the degrees of freedom. In addition, it reduces the problem of collinearity of regressions and modelling flexibility of behaviour differences within and between countries and/or groups or institutions (Biwott, 2011; Hsiao, 2007). Stationary is a situation where the mean, variance and autocorrelation of data structure do not change over time. Stationarity test is necessary to ensure that regression results are not spurious such that there is a high coefficient of determination between variables due to non-stationary (Wooldridge, 2012). The study conducted a harris-Tzavalis test to check for unit root of the data where the null hypothesis states that all panels have a unit root.

According to Lee (2008) in order to compare the usefulness of these models, three tests were run. First, fixed effects was tested by F test and the null hypothesis, all individual effects terms except one are zero, was rejected at 0.1% significance level. This suggests that the fixed effects model is better than the pooled OLS model. Second, random effects was examined by the Lagrange multiplier (LM) test and the null hypothesis, cross sectional variance components are zero, was rejected at 0.1% significance level. This argues in favor of the random effects model against the pooled data model. Finally, Hausman test was used to decide whether the fixed effect model or the random effect is appropriate model to explain the relationship between the variables. The null hypothesis is that random effect model is suitable. If the null hypothesis is rejected, then the fixed effect model should be used (Green, 2008). The null hypothesis is that there is no significant correlation between the individual effects and the regressors are rejected at 0.1% significant level in this test. If the chi-square test value is higher than the critical value, the null hypothesis is rejected and the fixed effect is deemed a better method of estimation.

### **3.8.1 Moderation procedure.**

The study sought the Moderating Effect of Board Financial Expertise on CAMELS Framework and Financial Performance of Commercial Banks in Kenya. A moderating variable is introduced when there is an unexpectedly weak or inconsistent relation between an independent variable and an outcome across studies. (Frazier *et all*, 2004), moderating variables can also be tested for the purpose of theoretical insights.

To perform moderation effect, the study had to meet the conditions for moderation, the  $R^2$  for with and without interactions should vary, the coefficient of the interactions should not be zero and the overall F value should be significant. This study used a hierarchical moderated regression analysis using specification of ordinary least squares (OLS). First, the study examined control variables through steps after which the unmoderated and moderated equations were developed in that order. The  $R^2$  change statistically was used to reveal significant moderation effect (Hair *et al.*, 2010). Where the variable is a moderator, a post-hoc graph would be created to depict the impact of the moderator in the relationship between predictor and criterion variables. The test facilitated the testing of the fourth study objectives to identify whether or not financial expertise affects the firm characteristic-financial performance relationship.

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + e_{1it} \dots \text{model 1}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + e_{2it} \dots \text{model 2}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + e_{3it} \dots \text{model 3}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + e_{4it} \dots \text{model 4}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + \beta_{11} AQ * BFE_{it} + e_{5it} \dots \text{model 5}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + \beta_{11} AQ * BFE_{it} + \beta_{12} ME * BFE_{it} + e_{6it} \dots \text{model 6}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + \beta_{11} AQ * BFE_{it} + \beta_{12} ME * BFE_{it} + \beta_{13} EQ * BFE_{it} + e_{7it} \dots \text{model 7}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + \beta_{11} AQ * BFE_{it} + \beta_{12} ME * BFE_{it} + \beta_{13} EQ * BFE_{it} + \beta_{14} Liq * BFE_{it} + e_{7it} \dots \text{model 8}$$

$$FP = \beta_{0it} + \beta_1 fa_{it} + \beta_2 fs_{it} + \beta_3 CA_{it} + \beta_4 AQ_{it} + \beta_5 ME_{it} + \beta_6 EQ_{it} + \beta_7 Liq_{it} + \beta_8 SMR_{it} + \beta_9 BFE_{it} + \beta_{10} CA_{it} * BFE_{it} + \beta_{11} AQ * BFE_{it} + \beta_{12} ME * BFE_{it} + \beta_{13} EQ * BFE_{it} + \beta_{14} Liq * BFE_{it} + \beta_{15} SMR_{it} * BFE_{it} + e_{7it} \dots \text{model 9}$$

Where;

$FP$  is the measure of financial performance (ROA)

$\beta_0$  is the constant of equation (represents the changes in dividend policy that cannot be explained by independent variables in the model)

$CA$  is the measure of Capital Adequacy

$AQ$  is the measure of Asset Quality

$ME$  is the measure of Management Efficiency

$EQ$  is the measure of Earnings Quality

$Liq$  is the measure of Asset Quality

$SMR$  is the measure of sensitivity to market risk

$e$  Is error term

$i$  Represent the firm

$t$  Represents the measure of time

### **3.8.2 Heteroscedasticity**

The problem of heteroscedasticity occurs when the variance for all observations are not the same, homoscedastic. That is, the variance of residuals is not constant for all observations. In such a case, the standard OLS estimators no longer produce minimum variance. The standard error of the coefficients gives inaccurate estimates. In the presence of heteroscedasticity, the estimated parameters may remain consistent but inefficient. In order to test for heteroscedasticity, the study performed White test for homoscedasticity to establish whether the variance of errors in a regression model is constant. This test was proposed by Halbert White in 1980. The null hypothesis states that there is presence of heteroscedasticity. Reject the null hypothesis if P value is less than 0.05.

### **3.8.3 Normality Test**

The study performed the Jarque-Bera test, a goodness of fit test of whether the sample data have skewness and kurtosis matching a normal distribution. Jarque and Bera (1987). Samples from a normal distribution have an expected skewness of zero and an expected kurtosis of 3 which is the same as a kurtosis of 3. A p value greater than 0.05 indicates that data is normal. Reject p value less than 0.05.

### **3.8.4 Autocorrelation**

One of the fundamental assumptions of Classical Linear Regression Model (CLRM) is that the covariance between the error terms over the time is equal to zero, or the error terms are not correlated with each other (Brooks, 2010). If however, the error terms are correlated, it creates the problem of autocorrelation or serial correlation, which leads to make the standard error biased. Hence, the standard OLS estimators no longer remain the minimum variance ones. This follows that a diagnostic test is required to check for the presence of serial correlation after each standard OLS regression of my analysis.

This study used Wooldridge Test for autocorrelation  $H_0$ : no first order autocorrelation. The decision criteria is reject  $H_0$  if level of significance is less than 0.05. (P value < 0.05)

### **3.8.5 Multicollinearity**

The problem of multicollinearity occurs when the relative movements of two or more independent variables match. In this, the standard OLS estimates become unable to distinguish between the variables. Given that many other independent variables in this study may have a prior suspect of multicollinearity, Variance Inflation Factors (VIF) and tolerance was tested after each standard OLS regression to examine the level of correlation between the variables. Variance Inflation Factors quantifies how much the variance is inflated. A VIF of 1 Means that there is no correlation among variables and

hence variance is not inflated. VIFs exceeding 4 warrant further investigation and VIFs exceeding 10 are signs of serious multicollinearity, reject if p value exceeds the level of significance of 10. (Applied Regression Analysis, 2018).

### **3.8.6 Hausman test**

To cater for the unobserved variables in the model and which may or may not have effect on the predictors included in the mode, Hausman specification test at 5% level of significance was conducted to determine the suitability of application of random or fixed effect model. Reject hypothesis if p-value is less than 0.05 (Green 2008).

### **3.9 Ethical Consideration**

The data collected from NSE was solely used for the purposes of this study and was not forwarded to any other party. The data was treated as confidential and all information sources were cited in the document and later referenced. Consent was also sought through a research permit sought from the National Commission for Science, Technology and Innovation (NACOSTI).

## CHAPTER FOUR

### RESEARCH FINDINGS AND DISCUSSION

#### 4.1 Introduction

This chapter presents the data analysis as well as the findings of the study based on the study objectives. The data was summarized and presented using tables. The collected data was analysed and interpreted in line with the study objective. The study employed different statistical techniques aided by STATA to analyze the data. This chapter also describes the data analysis, presentation and interpretation of the findings. The findings relate to the objectives that guided the study.

#### 4.2 Descriptive Statistics

The descriptive statistics for return on assets, capital adequacy, asset quality, management efficiency, earnings quality, liquidity, board financial expertise, firm size and firm age are presented in table 4.1. Findings showed that the return on assets was at a mean ratio of 25.0, capital adequacy levels were at an overall mean of 5.285, asset quality was at a mean of 39.27, management efficiency is 0.48, earning quality had a mean of 0.75, liquidity had a mean of 20.73, sensitivity to market risk had a mean of 3.4, board financial expertise had a mean of 0.97, firm size was at a mean of 7.475 and firm age 20.5

**Table 4. 1:Descriptive Results of Study Variables**

<b>Stats</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>P50</b>	<b>Mean</b>	<b>Kurtosis</b>	<b>Skewness</b>
ROA	290	-0.27	51.34	0.07	25.0	35.26	19.82
CA	290	0.05	10.52	0.70	5.285	36.96	4.59
AQ	290	7.77	70.77	0.19	39.27	36.51	-18.69
ME	290	0.01	0.95	0.17	0.48	2.58	0.88
EQ	290	0.01	0.74	0.27	0.75	2.80	0.32
LI	290	0.12	41.34	7.25	20.73	44.88	20.09
SMR	290	0.22	6.58	0.35	3.4	4.36	0.54
BFE	290	0.13	0.84	0.37	0.97	0.18	0.09
FS	290	3.79	11.16	7.24	7.475	4.57	-0.52
FA	290	3.00	38.00	53.00	20.5	2.55	0.42

Key=ROA= Return on Asset (financial performance), CA = Capital Adequacy, AQ= Asset Quality, ME= Management efficiency, LI=Liquidity, SMR=Sensitivity to Market Risks, BFE = Board Financial Expertise, FA = firm age, FS = firm size



### 4.3 Diagnostic Tests

The data sets were tested for the classical linear regression model assumptions. Brooks (2008) suggests that, in order to validly test the hypothesis and estimate the coefficient, five critical assumptions must be met before utilizing OLS estimation. The classical linear regression model assumptions are discussed below.

#### 4.3.1 The average value of the errors is zero.

If a constant term is included in the regression equation, this assumption will never be violated. So that in the model of this study a constant term is included. As a result, this assumption is not violated.

#### 4.3.2 The Assumption Heteroscedasticity.

Heteroscedasticity assumption requires that the variance of the errors to be constant. To check this assumption White test is conducted for the model (Table 4.2). The model has no problem of heteroscedasticity, the error variance is constant since the p-value is not significant, meaning that p-value is 0.1570 which is greater than 0.05. Consequently, the null hypothesis was not rejected since the error variance is constant.

**Table 4. 2:White's test for homoscedasticity**

White's test for Ho: homoscedasticity
against Ha: unrestricted heteroscedasticity
Chi <sup>2</sup> (14) = 19.22
Prob > chi <sup>2</sup> = 0.1568
Source (Field data, 2022)

#### 4.3.3 Normality

The Jarque-Bera test was used to assess normality, and it was found that the residuals were normally distributed. This means that there is no violation of the normal distribution assumption. The null hypothesis of the Jarque-Bera test is that the residuals of variables are normally distributed, while the alternative hypothesis is that the

residuals are not normally distributed. The p-value of the Jarque-Bera test in table 4.3 shows the value of 0.3818 which is larger than 0.05. It means that it is not significant and the null hypothesis cannot be rejected, meaning that the residuals are normally distributed.

**Table 4. 3: Jarque-Bera normality**

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj	----- joint ----- chi2(2)	Prob>chi2
My residuals	290	0.361	0.272		2.060	0.357
Jarque-Bera normality test: 1.926 Chi(2) 0.3818						
Jarque-Bera test for Ho: normality:						

Source (Field data, 2022)

#### 4.3.4 Unit root test

A time-series is said to be stationary if the mean and variance are constant over time. This means that the series will tend to drift around the mean due to the limited variance. The series can either be stochastic (randomly determined) or deterministic (displaying a trend). A non-stationary time series or a random walk model is one where the mean and variance continually change over time. The simple correlation coefficient between the X variable and its lagged variable is influenced by factors other than solely the length of the lag between the two (Studenmund, 2011). In the field of economics and finance, time related or seasonal shocks in one-time period may strongly influence subsequent periods. The following hypothesis was considered for this test:

Harris-Tzavalis unit-root test

*Ho: Panels contain unit roots*

*Ha: Panels are stationary*

**Table 4. 4:Unit Root Test**

<b>Harris-Tzavalis unit-root test</b>		
	<b>Statistic</b>	<b>p-value</b>
ROA	-5.556	0.000
CA	-2.921	0.002
AQ	-7.599	0.000
ME	5.134	0.000
EQ	-4.961	0.000
LI	-4.154	0.000
SMR	-3.046	0.001
BFE	-2.347	0.000
FA	5.134	0.000
FS	-4.961	0.000

Source (Field data, 2022)

Table 4.4 above shows results for unit root test using Harris-Tzavalis unit root test. The p-values in imply that the null hypothesis is rejected because the p values are less than 0.05 and hence accept the alternative hypothesis; this means that there is no unit root in the data, all panels are stationery. This in turn suggests that the means and variances in the data do not depend on time, and as a result, the application of OLS can produce meaningful results. (Gujarati, 2012).

#### **4.5.5 Autocorrelation**

Autocorrelation is a measure of how similar a time series is to itself at different lags. It is the degree of relationship between a variable's current value and its past values. Wooldridge test statistic is used to test autocorrelation in the residuals from a statistical regression analysis. The Wooldridge test statistic null hypothesis states that there is “no first-order autocorrelation”. Based on the findings in table 4.5, the  $\text{Prob}>F = 0.4966$  was more than 0.05, indicating that the  $H_0$  hypothesis is not rejected and that there was no first order autocorrelation (Field, 2009). Thus, the results indicate an insignificant autocorrelated relationship between all the independent variables and financial performance. This implied non-violation of the autocorrelation assumption.

**Table 4. 5: Wooldridge test for autocorrelation**

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
$F(1, 45) = 0.477$
Prob > F = 0.4966

Source (Field data, 2022)

#### 4.3.6 Multicollinearity

Multicollinearity occurs when two or more explanatory variables in a regression model are highly correlated. This can lead to questionable assessments of regression coefficients (Creswell, 2014). Brooks (2008) argues that it is common for explanatory variables to be correlated with each other, but this generally does not have a significant impact on precision. However, a problem occurs when the explanatory variables are highly correlated with each other. This problem is known as multicollinearity. Therefore, it is essential to assess multicollinearity. Consistent with the literature, this study considers correlation coefficients and Variance Inflation Factor (VIF) tests for multicollinearity (Cerbioni & Parbonetti 2007; Eng & Mak 2003; Haniffa & Cooke 2005; Haniffa & Cooke 2002; Ho & Wong 2001).

The main outcome of multicollinearity is that it increases the standard errors of estimates of the individual regression coefficients (betas). This in turn decreases the reliability of those estimates and can lead to incorrect results. A multicollinearity test can be used to check for the existence of high correlation between one or more predictor variables and one or more of the other independent variables. The variance inflation factor (VIF) is a measure of the correlation between predictor variables and the estimated variance due to linear dependence with other explanatory variables. A common rule is that VIFs of 10 or higher points to severe multicollinearity. (Allison, 2015). The VIF test results ranged from 1.21 to 2.54 (Table 4.6). Multicollinearity could

arise if the value of VIF is greater than 10, and tolerance is more than 0.20. Thus, there is no potential problem for this study from the VIF values.

**Table 4. 6:VIF test for Multicollinearity**

Variable	VIF	SQRT VIF	Tolerance	R- Squared
CA	2.54	1.59	0.394	0.606
AQ	2.28	1.51	0.439	0.561
ME	2.42	1.56	0.413	0.587
EQ	1.30	1.14	0.768	0.232
LI	1.21	1.1	0.829	0.171
SMR	1.34	1.16	0.749	0.251
BFE	1.38	1.18	0.723	0.277
FA	3.16	1.78	0.3163	0.008
FS	3.49	1.87	0.2869	0.071
Mean VIF	2.12			

Source (Field data, 2022)

#### 4.4 Correlation Analysis

Correlation analysis is a statistical technique that is used to measure the strength of the relationship between two variables. The strength of the relationship is measured by the correlation coefficient, which can range from -1 to +1. A value of -1 indicates a perfect negative relationship, meaning that as one variable increases, the other decreases. A value of +1 indicates a perfect positive relationship, meaning that as one variable increases, the other increases. A value of 0 indicates that there is no relationship between the two variables. The correlation results were summarized and presented in table 4.7

Results in table 4.7 show that capital adequacy is positively related with financial performance ( $r=0.408$ ), this means that increase in capital adequacy increases financial performance. This is in line with (Amahalu, 2018) who found positive and significant relationship between capital adequacy and financial performance. The output also shows that asset quality is positively related with financial performance ( $r=0.533$ ). This

means the higher the asset quality the higher the financial performance. This agrees with (Wambugu, 2019) that asset quality significantly explains the changes in the financial performance of commercial banks in Kenya.

The correlation results indicated that management efficiency is positively related with financial performance ( $r = 0.501$ ). This means that there is a significant relationship between management efficiency and financial performance of commercial banks in Kenya. Therefore the study recommends that commercial banks should hire efficient managers so as to improve their performance. This is in agreement with (Omete, 2019) there is a strong positive relationship between financial performance of commercial banks and financial management efficiency.

Further, earnings quality was also positively related with financial performance ( $r=0.193$ ). Thus, increases in earnings quality leads to increase in financial performance. This finding is in line with (Utami, 2019), (Duarte, 2022). The correlation results indicated that sensitivity to market risks is negatively related with financial performance ( $r = -0.331$ ). Therefore, an increase in sensitivity to market risk leads to a decrease in financial performance. Liquidity and board financial expertise were positively correlated with financial performance, ( $r=0.077$ ) and ( $r=0.0339$ ) respectively.

The moderation results indicated that the interaction effect of board financial expertise on the relationship between the independent variables were as follows: Capital Adequacy interacted with board financial expertise have a positive relationship with financial performance ( $r=0.1036$ ), asset quality interacted with board financial performance has a positive relationship ( $r=0.5068$ ) with financial performance, management efficiency interacted with board financial performance has a positive

relationship with financial performance ( $r=0.1352$ ), earnings quality interacted with board financial expertise has a positive relationship with financial performance ( $r=0.3383$ ), liquidity interacted with board financial expertise has a positive relationship with financial performance of commercial banks ( $r=0.2382$ ), sensitivity to market risks interacted with board financial expertise has a negative relationship ( $r=-0.3165$ ) with financial performance.

Firm age showed a negative relationship with financial performance of commercial banks ( $r=-0.2300$ ). This means that as the age of the firm increases, financial performance decreases. From the findings, it can be argued that older banks may not perform better than younger banks which are still growing. This is in line with Dogan (2013) who found a negative relationship between bank performance and firm age. Firm size showed a positive relationship ( $r=0.395$ ) with bank financial performance. This means that an increase in bank size increases financial performance. This is because big firms enjoy a number of benefits accruing from the economies of scale and they also have better resources than smaller banks. Large firms have more capacity and capabilities.

**Table 4. 7:Correlation Results**

	ROA	CA	AQ	ME	EQ	SMR	LI	BFE	CA* BFE	AQ* BFE	ME* BFE	EQ* BFE	SMR* BFE	LI* BFE	FA	FS
ROA	1															
CA	.408**	1														
AQ	.533**	0.4651*	1													
ME	.501**	0.4939*	0.2148*	1												
EQ	.193**	0.1654**	-0.0531	0.0011	1											
SMR	-.331**	0.7040*	0.4443**	0.3217*	0.0938*	1										
LI	0.077	-0.0396	0.1263*	0.0040	-0.0206	-0.0027	1									
BFE	0.039**	0.6861**	0.433*	0.394*	-0.0267	0.4775*	0.3851*	1								
CA* BFE	.1036*	0.3642*	0.7850*	0.1560*	-0.0860*	0.3725**	0.0387	0.4627*	1							
AQ* BFE	.5068**	-0.0159	0.1156*	0.3974**	0.0069	0.0068	0.4045**	0.1417*	0.1587*	1						
ME* BFE	.1352	-0.0262	-0.1929*	-0.0621	0.7224**	-0.0797	-0.3053*	-0.2831*	-0.2262*	-0.0768	1					
EQ* BFE	.3383**	0.2240**	0.3291**	0.1983*	0.1618**	0.2208*	0.8670*	0.5849*	0.3046*	0.4652*	-0.1277	1				
SMR* BFE	-.3165*	-0.1386*	-0.4659*	-0.1062*	0.0142	-0.1714*	-0.0673	-0.0883*	-0.3702*	-0.1198*	0.0135	-0.1791*	1			
LI* BFE	0.2382*	0.0751	-0.4347*	0.1662*	-0.0469	-0.0607	0.0214	0.1183*	-0.3145*	0.0583	-0.0417	-0.0271	0.0927*	1		
FA	-.230**	-0.2109*	-0.2618*	-0.1869*	-0.0213	-0.2171*	-0.1155*	-0.1655*	-0.2727*	-0.1938*	0.0910*	-0.2133*	0.4526*	-0.0590	1	
FS	0.395	-0.0226	0.1263*	0.0343	-0.1087*	-0.0673	0.0628	0.0630	-0.4659*	0.1662*	0.0068	-0.3702*	0.2262*	0.0214	-0.063	1

Source (Field data, 2022)



## 4.5 Fixed and Random Effect Models

### 4.5.1 Random effect

The random effect model estimates the coefficients based on the assumption that the individual or group effects are uncorrelated with other independent variables. The regression results for the random model are illustrated in table 4.8. The random model showed that capital adequacy, asset quality, management efficiency, earnings quality, liquidity and sensitivity of market risks explained variation of financial performance. Capital adequacy showed a positive and significant effect on financial performance ( $\beta=0.991$ ,  $\rho<0.05$ ) (Table 4.8.). With an increase in capital adequacy by 0.991 units, financial performance is increased by the same unit.

Asset quality showed a positive and significant effect on financial performance ( $\beta=0.665$ ,  $\rho<0.05$ ). Therefore, an increase in asset quality by 0.665 units leads to an increase in financial performance by the same unit. Furthermore, management efficiency showed a positive and a significant effect on financial performance ( $\beta=0.512$ ,  $\rho<0.05$ ). Therefore, an increase in management efficiency by 0.512 units increases financial performance by the same units.

In addition, earnings quality showed a positive and a significant effect on financial performance ( $\beta=0.438$ ,  $\rho<0.05$ ). Specifically, an increase in earnings quality by 0.438 units, leads to an increase in financial performance by the same unit. Liquidity had a significant influence on financial performance ( $\beta=0.693$   $\rho>0.05$ ). Finally, sensitivity of market risks had a negative and significant effect on financial performance ( $\beta= -0.682$   $\rho>0.05$ ). Thus, an increase in sensitivity of market risks by 0.682 units, leads to a decrease in financial performance by the same units.

**Table 4. 8:Random-effects GLS regression**

	Number of obs	=	290			
	Number of groups	=	29			
Group variable: firm ID	Obs per group: min	=	2			
R-sq: within = 0.6766	Avg	=	10			
between = 0.1810	Max	=	10			
overall = 0.5609	Wald chi2(7)	=	360.54			
corr(u_i, X) = 0 (assumed)	Prob > chi <sup>2</sup>	=	0			
ROA	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
CA	0.991	0.249	3.980	0.000	0.503	1.479
AQ	0.665	0.128	5.220	0.000	0.415	0.915
ME	0.512	0.090	5.660	0.000	0.690	0.335
EQ	0.438	0.071	6.160	0.000	0.577	0.298
LI	0.693	0.816	0.850	0.396	2.291	0.906
SMR	-0.682	0.201	-3.390	0.001	-1.076	-0.288
FS	0.832	0.705	1.180	0.238	2.218	0.554
FA	-0.399	0.169	-2.360	0.009	-0.066	-0.731
_cons	1.262	2.281	0.550	0.580	-3.209	5.733
sigma_u	0.7433					
sigma_e	1.4542					
Rho	0.2072		(fraction of variance due to u_i)			

Source (Field data, 2022)

#### 4.5.2 Fixed effect

A fixed effects model is a type of regression model where the independent variables are not random, but fixed. This means that the model can be used to predict the dependent variable based on the values of the independent variables. The fixed effects model is a powerful tool for analyzing data and can be used to test hypotheses about how the dependent variable responds to changes in the independent variable.

Table 4.9 highlights the regression results for the fixed effects model. The findings indicated that financial performance is explained by capital adequacy, asset quality, management efficiency, earnings quality, liquidity and sensitivity of market risks. Capital adequacy showed a positive and significant effect on financial performance ( $\beta=0.971$ ). Specifically, an increase in capital adequacy by 0.971 units, leads to an increase in financial performance by the same unit. The t-value = 3.880 more than the standard error implying null hypothesis falls in rejection region.

Moreover, asset quality showed a positive and significant effect on financial performance ( $\beta= 0.592$ ). Consequently, an increase in asset quality by 0.592 units leads to an increase in financial performance by the same unit. Furthermore, management efficiency showed a positive and significant effect on financial performance ( $\beta=0.591$ ). Consequently, an increase in management efficiency by 0.591 units leads to an increase in financial performance by the same unit. Earnings quality showed a positive and significant effect on financial performance ( $\beta=0.343$ ). Specifically, an increase by 0.343 units, leads to an increase in financial performance by the same unit.

Further, liquidity ( $\beta=0.973$ ) had a positive and significant effect on financial performance. The implication is that, an increase in liquidity, results in a subsequent increase in financial performance. Finally, sensitivity of market risks ( $\beta= -0.616$ ) had a negative and a significant effect on financial performance. Therefore, an increase in sensitivity of market risks by -0.616 units leads to a decline in financial performance by the same unit. Its t-value =-2 which is less than the standard error.

**Table 4. 9:Fixed-effects (within) regression**

	Number of obs	=	290			
	Number of groups	=	2			
Group variable: firmID	Obs per group: min	=	10			
R-sq: within = 0.6825	Avg	=	8.6			
between = 0.0864	Max	=	10			
overall = 0.5316	F(7,182)	=	55.9			
corr(u_i, Xb) = -0.0855	Prob > F	=	0.000			
<b>ROA</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>T</b>	<b>P&gt;t</b>	<b>[95% Conf.</b>	<b>Interval]</b>
CA	0.971	0.250	3.880	0.000	0.477	1.465
AQ	0.592	0.126	4.690	0.000	0.343	0.842
ME	0.591	0.094	6.310	0.000	0.776	0.406
EQ	0.343	0.071	4.850	0.000	0.482	0.203
LI	0.973	0.835	1.170	0.245	2.619	0.674
SMR	-0.616	0.257	-2.400	0.017	-1.123	-0.109
FS	1.072	0.541	1.980	0.047	2.132	-0.013
FA	-0.183	0.122	1.500	0.133	-0.056	0.423
_cons	1.667	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.275					
sigma_e	1.454					
Rho	0.435	(fraction of variance due to u_i)				
F test that all u_i=0: F(24, 182) = 5.47 Prob > F = 0.0000						

Source (Field data, 2022)

#### 4.5.3 Hausman test

Fixed or random effects can be assessed using hausman test where the null hypothesis preferred model is random effects compared to the fixed effects (Greene, 2008). The test is whether unique errors ( $u_i$ ) are correlated with the regressors; the null hypothesis is that they are not. The Hausman Specification test (Hausman, 1978) is conducted to select either fixed or random effect estimator. The null hypothesis estimates the panel data using random effect estimator, while the alternative is the fixed effect model which is the appropriate estimator. Rejecting the null ( $p$ -value  $< 0.05$ ) indicates the fixed effect model is to be used.

The panel data model allows using either the fixed effect models or random effect models to estimate the dependence relationship among the variables, while taking note of the issue of omitted variables. The decision to use fixed effect or random effect models was made based on the results of Hausman test (Table 4.10).

The Hausman test table 4.10 shows a summary of the results. It also shows the null hypothesis of “difference in coefficients not systematic” as well as determinants of risk-taking that should be rejected. This is because the chi-square value of 18.18 was significant,  $p$ -value = 0.0112. Therefore, this implies that, effect of hypothesis is tested using the fixed effects model. This means that the most appropriate model is the fixed effects.

**Table 4. 10: Hausman Test**

---- Coefficients ----				
	(b) Fe	(B) Re	(b-B) Difference	$\sqrt{\text{diag}(V_b - V_B)}$ S.E.
CA	0.971	0.991	-0.020	0.027
AQ	0.592	0.665	-0.073	.
ME	-0.591	-0.512	-0.079	0.025
EQ	-0.343	-0.438	0.095	.
LI	-0.973	-0.693	-0.280	0.177
SMR	-0.616	-0.682	0.066	0.160
FS	-0.832	-1.072	0.240	0.452
FA	0.399	0.183	0.215	0.117

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic  
 $\chi^2(7) = (b-B)[(V_b - V_B)^{-1}](b-B)$   
 = 18.18  
 Prob> $\chi^2$  = 0.0112

Source (Field data, 2022)

#### 4.6 Testing of Hypothesis

Based on the Hausman test, the study hypotheses were tested using fixed effect. Consequently, the fixed effect results were used in the final analysis to overcome the deficiencies associated with the random effect results similar to Wachira (2017). As Kohler and Kreuter (2009) suggest, the fixed effect estimator handles better models that contain time invariant variables that are usually omitted by the random-effects model. The hypothesis tests findings are as follows:

*H<sub>01</sub>: Capital adequacy has no significant effect on financial performance of commercial banks in Kenya.*

Based on the findings, hypothesis 1 was rejected ( $\beta_1 = 0.971$ ,  $p=0.000<0.05$ ). This indicates that capital adequacy enhances the financial performance of commercial banks in Kenya. The findings are supported by Chinada (2015) who indicated that Zimbabwean banks with sufficient capital had a competitive edge since they offered more items, thus enabling them capture a bigger market share. In the same way, Nekesa (2017) established that capital sufficiency contributes decidedly to an organization's financial performance. Contrary to the results, Almazari and Alamri, (2017) elucidated that there is a negative and significant relationship between huge levels of capital adequacy and profitability. Similarly, Berger and Bouwman (2013) found a significant relationship between capital ampleness and global bank gainfulness. Also, the findings tally with that of Ali (2016) which found a linear relationship between capital adequacy and banks' productivity. Evidence from the literature suggests that there is a mixed relationship between capital adequacy and financial performance. In the Kenyan context, the study adds insights on the negative link between capital adequacy and financial performance of commercial banks in Kenya.

*H<sub>02</sub>: Asset quality has no significant effect on financial performance of commercial banks in Kenya.*

The above hypothesis was rejected based on the findings from fixed model which showed that asset quality has a positive and significant effect on financial performance of commercial banks in Kenya ( $\beta_2 = 0.592$ ,  $p=.000<.05$ ). The study findings are supported by Kadioglu *et al.* (2017) who explained that there is a significant negative relationship between non-performing loans and bank profitability. The higher the non performing loans, the lower the asset quality leading to lower return on assets and

return on equity. (Nimesh, 2017) Poor asset quality has a significant negative impact on bank's profitability. Lucky and Andrew (2015) concluded that there is a significant relationship between asset quality and the profitability of banks in Nigeria.

*H<sub>03</sub>: Management efficiency has no significant effect on financial performance of commercial banks in Kenya.*

The study established that management efficiency had a positive and significant effect on financial performance ( $\beta_3 = 0.581$ ,  $p = .000 < .05$ ). Thus, hypothesis H<sub>03</sub> was rejected. The findings are in agreement with Kaneza (2016), management efficiency is positively associated with performance. Notably, the findings contrast prior studies which suggest that there is a positive relationship between management efficiency and financial performance.

*H<sub>04</sub>: Earnings quality has no significant effect on financial performance of commercial banks in Kenya.*

Findings show that hypothesis 4 was rejected. Earnings positively influenced financial performance of commercial banks in Kenya. This is consistent with the finding, of Saleh (2020) which espoused that high earnings quality increases the companies' performance of Jordanian Industrial public shareholding companies. The findings also agree with Machdar *et al.* (2017) who opined that operating performance is positively affected by earnings quality, and negatively affected by real earnings management. However, Martowidjojo *et al.* (2019) found that paying out dividends decreases the market value of a company, while issuing equity decreases the market value of a company. Thus, prior studies literature indicates that there is a mixed relationship between earnings quality and financial performance. However, the present study contributes new information on the positive link between earnings quality and financial performance of commercial banks.

*H<sub>05</sub>: Liquidity has no significant effect on financial performance of commercial banks in Kenya.*

The findings of the fixed effect model showed that liquidity had a significant effect on the financial performance of commercial banks in Kenya ( $\beta_5 = 0.973$ ,  $p = 0.245 > 0.05$ ). Rizwan & Mutahhar (2016) found out that there is a significant positive relationship between the banks' liquidity and profitability. The same notion was shared by Oblor (2013) who concluded that there is positive link between bank liquidity and the financial performance of Nigerian banks. However, Alomari and Azzam (2017) found that liquidity was inversely related to ROA. As opposed to the study, Muriithi (2016) revealed that change in liquidity coverage ratio did not have any corresponding change on the financial performance of commercial banks operating in Kenya between 2005 and 2014. In the same way, Kinyua (2018) indicated that liquidity had no significant effect on the profitability of the targeted insurance firms. Further, using the random effect model, Patrick (2018) revealed that liquidity management does not significantly influence the performance of Nigerian insurance firms. Also, Derbali & Jamel (2014) elucidated that liquidity had no effect on the profitability of the Tunisian insurance firms. In the banking industry,

Evidently, there is no consensus on the direction between liquidity and financial performance of commercial banks in Kenya. However, the current study maintains that there is a negative relationship between liquidity and financial performance of commercial banks in Kenya.

*H<sub>06</sub>: Sensitivity of the market risk has no significant effect on financial performance of commercial banks in Kenya.*

The study indicated that sensitivity of the market risk had a negative and significant effect on financial performance ( $\beta_6 = -0.616$ ,  $p = 0.017 < 0.05$ ). Thus, hypothesis H<sub>06</sub> was



rejected. The findings tally with that of Muriithi et al., (2016) which indicated that market risk as measured by degree of financial leverage, interest rate risk and foreign exchange exposure had a negative and significant relationship with bank profitability. In contrast, Al-abadallat (2019) found that sensitivity to risk positively and significantly performance (ROA).

#### **4.7 Hierarchical Regression Model**

The hypotheses were tested using hierarchical regression analysis, in which the variables are entered in successive blocks, Table 4.11. Thus, Model I, the baseline model, includes only the control variables: firm age (FA) and firm size (FS). Model 2 includes, in addition to the control variables, all the independent variables introduced in block, that is, capital adequacy (CA), asset quality (AQ), management efficiency (ME), earnings quality (EQ), liquidity (LI) and sensitivity to market risks (SMR).

Model 3 additionally includes the moderating variable (board financial expertise (BFE)). Model 4 to Model 9 additionally includes an interaction term between the variables board financial expertise (BFE) and capital adequacy on the financial performance, thus, "CA\*BFE", board financial expertise and asset quality on the financial performance, called "AQ\*BFE, board financial expertise and management efficiency on financial performance, called "ME\*BFE", board financial expertise and earnings quality on financial performance, called "EQ\*BFE", board financial expertise and liquidity on financial performance, called "LI\*BFE", and sensitivity of market risk on the financial performance, called "SMR\* BFE". It should be noted that the moderating effect is significant if the change in the determination coefficient is significant. In this regard, empirical evidence indicates that an increase of more than 1 percent can be considered significant and therefore indicates the existence of a large moderating effect

Hypothesis H<sub>0</sub>7a stated that board financial expertise has no significant moderating effect on the relationship between capital adequacy and financial performance of commercial banks in Kenya. The results indicated a positive and significant moderating effect of board financial expertise on the relationship between capital adequacy and financial performance ( $\beta=2.95$ ;  $\rho<0.05$ ) (Table 4.11). Further, results revealed board financial expertise enhances relationship between capital adequacy and financial performance with 1% (R-sq $\Delta$  =.01). Hence, the hypothesis H<sub>0</sub>5a was rejected. This implies that through board financial expertise, the banks have the ability to identify and assess financial risks, make informed decisions about risk management strategies, and monitor and evaluate the effectiveness of those strategies. This, in turn, helps to ensure that the bank has adequate capital to support its operations and helps to improve financial performance.

Further, the results indicated a positive and significant moderating effect of board financial expertise on the relationship between asset quality and financial performance of commercial banks in Kenya ( $\beta= 0.23$ ;  $\rho<0.05$ ). Results also indicated that after introducing board financial expertise, the relationship between asset quality and financial performance increase with 1% (R-sq $\Delta$  =.01).

Hence, hypothesis H<sub>0</sub>7b stating that board financial expertise has no significant effect on the relationship between asset quality and financial performance was rejected. Since ( $\beta= 0.02$ ;  $\rho<0.05$ ). Therefore, a board with financial expertise is able to make sound decisions that improve the asset quality of the bank, which in turn improves the financial performance of the bank.

Board financial expertise had a significant moderating effect on the relationship between management efficiency and the financial performance of commercial banks in

Kenya ( $\beta = 0.28$ ;  $\rho < 0.05$ ). More findings showed that board financial performance strength the relationship between management efficiency and financial performance with 1% ( $R\text{-sq}\Delta = .01$ ). Hence, the hypothesis H<sub>07c</sub> was rejected. It implies that board financial expertise enhances the relationship between management efficiency and bank financial performance by providing critical oversight and advice on financial matters. This allows management to make informed decisions on how to best use the bank's resources to achieve its financial goals. In turn, this can lead to improved financial performance for the commercial banks in Kenya.

However, board financial expertise had no significant moderating effect on the relationship between earnings quality and financial performance of commercial banks in Kenya ( $\beta = 0.79$ ;  $\rho < 0.05$ ). It means that board financial expertise does strengthen the relationship between earnings quality and financial performance. Hence, the hypothesis H<sub>07d</sub> was rejected. Therefore, board financial expertise has effect on the link between earnings quality and the financial performance of commercial banks in Kenya.

Similarly, board financial expertise had no significant relationship on the link between liquidity and financial performance of commercial Banks,  $\beta = 0.48$ ,  $\rho < 0.05$ . Hence, the hypothesis H<sub>07e</sub> was rejected. Finally, board financial expertise had no significant moderating effect on the relationship between sensitivity of market risk and financial performance of commercial banks in Kenya  $\beta = 0.76$ ,  $\rho < 0.05$ . Hence, the hypothesis H<sub>07f</sub> was rejected

**Table 4. 11: Hierarchical regression model**

	Model 1 Coef.	Model 2 Coef.	Model 3 Coef	Model 4 Coef.	Model 5 Coef.	Model 6 Coef.	Model 7 Coef.	Model 8 Coef.	Model 9 Coef.
Constant	-3.58(2.97)	1.26(2.28)	3.1(.2.24)	2.13(3.79) *	-1.45(13.68) **	0.21 (0.41) **	2.45(13.32)**	0.01(.13.0) *	-1.07(.40) **
<b>Controls</b>									
FS	2.11(1.09)**	0.68(.29)	0.53(.09) *	0.89(.13) **	1.95(1.06) *	0.13(0.03) **	3.55(2.07)**	-0.26(0.07) **	0.00(0.08)
FA	-0.26(0.7)	-0.19(0.3) **	-.04(-0.48)	0.12(1.26)	-0.05 (0.30)	0.03(0.01) **	-0.03 (0.33) *	-0.02(0.31)	-0.04(0.29)
<b>Predictors</b>									
CA		0.6(0.04) **	-0.66(.80)	-13.89(4.90)	-16.14(4.86) **	0.18(3.17) **	-18.39(4.7)**	-18.3(5.7)**	0.97 (0.04) **
AQ		0.03(0.02) *	-0.76(.20)**	-0.84(.20)**	-0.78(.20)**	0.11 (0.61)	-0.78(.19)**	-0.79(.19)**	0.59 (.03)
ME		0.14(0.03) *	1.09(.24)**	-7.10(3.00)*	-8.45(2.97)**	0.95 (4.77) *	-10.10(2.90)**	-10.0(2.91)**	0.58(0.04) **
EQ		0.10(0.02) *	0.64(.13)**	0.59(.13)**	0.43(.14)**	0.14 (2.19) *	0.37(.13)*	0.37(.14)*	0.34(0.03) *
LI		-0.59(.09)**	-0.47(.09)**	-0.41(.09)**	-0.42(.09)**	0.02(2.13) *	0.51(.09)**	0.79(.09)**	0.97 (.02)
SMR		-0.34(.07)**	-0.42(.07)**	0.45(.07)**	0.46(.07)**	-0.03(0.32) *	0.50(.07)**	0.49(.07)**	- 0.62(0.1)**
<b>Moderator</b>									
BFE			-0.52(.21)*	2.95(1.08)*	1.20(.31)**	0.04(0.02) *	-0.64(.34) *	0.53(.37)	1.65(.41)**
<b>Interactions</b>									
CA * BFE				-0.61(.21)*	3.45(1.07)**	-0.12 (-1.52) * *	-0.02(0.00) **	-0.01(0.00) **	2.95 (0.01) **
AQ * BFE					0.23(.09)*	0.01 (-3.06) *	4.03(1.04)**	0.04(0.00) *	0.02(0.01) **
ME * BFE						0.00 (-2.69) *	0.19(.09)*	4.00(1.04)**	0.28 (0.02) **
EQ * BFE							0.28(.08)**	0.19(.09)*	0.79(.07)*
LI * BFE								0.18(.06)**	0.48(.08)*
SMR* BFE									0.76(.01) **
R-sq: within	0.0492	0.5561	0.5921	0.6078	0.6195	0.6389	0.6491	0.6644	0.6873
R-sq change		0.51	0.036	0.016	0.01	0.019	0.01	0.015	0.023
Sigma_u	0.686	0.550	0.596	0.617	0.546	0.396	0.529	0.522	0.503
Sigma_e	0.424	0.399	0.406	0.406	0.393	0.005	0.390	0.390	0.390
rho	0.723	0.656	0.683	0.673	0.658	0.503	0.649	0.642	0.624
Wald $\chi^2$ (3)	24.72	360.54	400.98	415.99	441.89	0.390	487.06	487.71	155.77
Prob > $\chi^2$ =	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Durbin	1.021	1.601	1.615	1.856	1.991	2.130	2.001	2.113	2.072
Watson									
Total panel observations	290	290	290	290	290	290	290	290	290

\*\*significance level 0.01, \*significance level 0.05; figures in parenthesis are t-statistics; source: Research Data, (2022)

**Table 4. 12: Summary of Test of Hypotheses Results**

<b>Hypothesis</b>	<b>Beta</b>	<b><i>p</i> – Values</b>	<b>Decision</b>
<b>H<sub>01</sub>:</b> Capital adequacy has no significant effect on financial performance of commercial banks in Kenya.	0.97	$\rho < 0.05$	Reject
<b>H<sub>02</sub>:</b> Asset quality has no significant effect on financial performance of commercial banks in Kenya.	0.59	$\rho < 0.05$	Reject
<b>H<sub>03</sub>:</b> Management efficiency has no significant effect on financial performance of commercial banks in Kenya.	0.58	$\rho < 0.05$	Reject
<b>H<sub>04</sub>:</b> Earnings quality has no significant effect on financial performance of commercial banks in Kenya.	0.34	$\rho < 0.05$	Reject
<b>H<sub>05</sub>:</b> Liquidity has no significant effect on financial performance of commercial banks in Kenya.	0.97	$P < 0.05$	Reject
<b>H<sub>06</sub>:</b> Sensitivity of the market risk has no significant effect on financial performance of commercial banks in Kenya.	-0.62	$\rho < 0.05$	Reject
<b>H<sub>07a</sub>:</b> Board financial expertise has no significant moderating effect on the relationship between capital adequacy and financial performance of commercial banks in Kenya.	2.95	$\rho < 0.05$	Reject
<b>H<sub>07b</sub>:</b> Board financial expertise has no significant effect on the relationship between asset quality and financial performance.	0.02	$\rho < 0.05$	Reject
<b>H<sub>07c</sub>:</b> Board financial performance strength the relationship between management efficiency and financial performance	0.28	$\rho < 0.05$	Reject
<b>H<sub>07d</sub>:</b> Board financial expertise had no significant moderating effect on the relationship between earnings quality and financial performance of commercial banks in Kenya	0.79	$\rho < 0.05$	Reject
<b>H<sub>07e</sub>:</b> Board financial expertise had no significant relationship on the link between liquidity and financial performance of commercial Banks.	0.48	$\rho < 0.05$	Reject
<b>H<sub>07f</sub>:</b> board financial expertise had no significant moderating effect on the relationship between sensitivity of market risk and financial performance of commercial banks in Kenya.	0.76	$\rho < 0.05$	Reject

\* $p < 0.05$ **Source:** Research Data (2022)

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

The purpose of this study was to determine the effect of CAMELS framework, moderating effect of board financial expertise on financial performance of commercial banks Kenya. The specific objectives and hypotheses guided the study. The findings of the study are summarized in this chapter, along with the conclusion, recommendations, and areas for further research.

#### **5.2 Summary of Findings**

The findings of the study have been summarized below as per the study objectives. The study's objectives were to determine the effect of capital adequacy, asset quality, management efficiency, earnings quality, liquidity and sensitivity of market risk on the financial performance of commercial banks. Further, the study aimed at establishing the moderating effect of board financial expertise on the relationship between the CAMELS framework (capital adequacy, asset quality, earnings quality, liquidity and sensitivity of market risks) and the financial performance of commercial banks in Kenya.

The study relied on a combination of explanatory and longitudinal research design. The study was conducted by analyzing the content of financial reports of 29 commercial banks in Kenya, through inclusion exclusion criteria, registered with Central bank of Kenya. Diagnostic tests were conducted after highlighting the descriptive results on the moderating effect of board financial expertise on the relationship between the CAMELS framework and the financial performance of commercial banks in Kenya.

The normality test revealed no violation of the normal distribution assumption of error terms as the residuals came out to be normal. Besides, there was no heteroscedasticity in the residuals as the null hypothesis of constant variance was not rejected at the 5% significance level. In addition, there was no multicollinearity problem among the independent variables. Finally, there is a linear relationship between the independent and dependent variable.

Further, the correlation findings revealed that capital adequacy, asset quality, management efficiency, and liquidity were positively correlated with financial performance of commercial banks in Kenya. However, sensitivity of market risks and board financial expertise were not correlated with financial performance.

The hausman test indicated that the fixed effect model was appropriate for hypotheses testing. Thus, the results from the fixed effect model indicated that capital adequacy, asset quality, management efficiency, earnings quality and liquidity had a positive and significant effect on the financial performance of commercial banks in Kenya. However sensitivity to market risks had a negative effect the financial performance of commercial banks in Kenya.

Regarding the moderation effect, board financial expertise positively moderates the relationship between; capital adequacy and financial performance, management efficiency and financial performance as well as asset quality and financial performance of commercial banks in Kenya. However, board financial expertise had no significant moderating effect on the relationship between: earnings quality and financial performance, liquidity and financial performance as well as sensitivity of market risk and financial performance of commercial banks in Kenya.

### **5.3 Conclusion**

The study found that capital adequacy had a positive and significant effect on financial performance of commercial banks in Kenya. This means that banks with higher capital adequacy ratios tended to have superior financial performance. Besides, when capital adequacy was moderated with board financial expertise, there was a positive and significant relationship between the two variables. The implication is that, when a board has financial expertise, it is more likely to lead to a positive financial performance.

Further, the study revealed that commercial banks in Kenya with better asset quality exhibit better financial performance. It means that the banks have higher ROAs and they tend to generate more income. Thus, the banks are in a position to maximize their profitability and create value for shareholders. The relationship is further strengthened by the presence of board financial expertise. Thus, a board with financial expertise is able to make sound decisions that improve the asset quality of the bank, which in turn improves the financial performance of the bank.

In addition, the study found that management efficiency has a positive effect on financial performance. When moderated with board financial expertise, there was a positive relationship between management efficiency and financial performance of commercial banks in Kenya. It means that boards with greater financial expertise are more likely to be effective in oversight of the company's financial management. This is important because the financial management of a bank is a critical determinant of its financial performance.

The findings also indicated that earnings quality positively affected the financial performance of commercial banks in Kenya. However, when moderated with board financial expertise, there was no significant link between earnings quality and financial



performance. There is a possibility that the commercial banks are finding it a challenge to carefully manage their portfolios and ensure their loans are of good quality.

Evidence suggests that liquidity positively influences the financial performance of commercial banks in Kenya. However, in the presence of board financial expertise, there was no significant relationship between liquidity and the financial performance of commercial banks in Kenya.

Finally, the study found that commercial banks in Kenya have worse financial performance when they are more sensitive to market risk. The reason for this is that sensitivity of market risk increases the likelihood that the bank will suffer losses. When a bank suffers losses, its capital decreases, which can lead to declined financial performance. It was further indicated that board financial expertise does not significantly moderate the relationship between the sensitivity of the market risk and financial performance of commercial banks in Kenya.

#### **5.4 Recommendations**

The study is indicative of a positive link between capital adequacy and financial performance of commercial banks in Kenya. Therefore, it is important for commercial banks to ensure they have adequate levels of capital. This means that the banks have enough money to cover its losses and to continue operating even in the event of a major financial shock. Another way to improve bank financial performance is to make sure that the boards of directors have the financial expertise to make sound decisions. This includes having a good understanding of financial markets and the risks involved in lending and investment activities.

Further, asset quality positively influences the financial performance of commercial banks. Therefore, to improve bank financial performance through asset quality, it is

important to focus on key areas such as credit risk, interest rate risk, and operational risk. Additionally, it is essential to have a strong process in place for identifying, measuring, and monitoring these risks. By doing so, banks can take proactive steps to mitigate and manage these risks, which will in turn improve asset quality and overall financial performance. In addition, by increasing board financial expertise, banks can improve their risk management and capital planning. This will help to ensure that the bank is able to withstand any future financial storms.

Since board financial expertise positively moderates the relationship between management efficiency and financial performance of commercial banks, there is a need for the board to ensure that the management team has the financial expertise necessary to make sound decisions. This financial expertise can help the management team to make decisions that improve the company's financial performance.

Additionally, to improve financial performance through earnings quality, commercial banks could improve the quality of their loans. This can be done by ensuring that loans are made to borrowers who have a good chance of repayments, and by properly monitoring the loans that are made. It is important to improve the financial expertise of the board so that they can provide better oversight of the bank's financial operations and help to enhance the financial performance.

Further, in order to improve the financial performance of banks through liquidity, it is important to ensure that banks have access to the necessary funding to meet their obligations. This can be done by providing liquidity to the banking system through the use of central bank facilities, such as the discount window. In addition, it is important to maintain the stability of the banking system by ensuring that banks are able to meet their capital requirements.

Finally, banks can tackle the sensitivity of market risk and improve their financial performance by hedging their portfolios, managing their liquidity, and stress-testing their portfolios. By hedging, banks can offset some of the risk associated with market movements. Another way is to use financial instruments that are less sensitive to market risk. For example, banks can use instruments that are not as vulnerable to interest rate changes.

### **5.5 Further Research Recommendations**

The study revealed that board financial expertise moderates the relationship between; capital adequacy and financial performance, management efficiency and financial performance as well as asset quality and financial performance of commercial banks in Kenya. However, there is still a lack of consensus on the exact nature of this moderating effect. Future studies should aim to provide more clarity on the mechanisms through which board financial expertise can influence the relationship between these different variables. Additionally, future studies should also explore the moderating effect of board financial expertise on other aspects of banks financial performance, such as risk management.

Further, as the banking sector continues to grow and evolve, so too will the need for research on the relationship between capital adequacy, asset quality, earnings quality, liquidity and banks financial performance. In particular, given the increasing importance of capital adequacy in the wake of the Covid-19 (corona virus disease 2019) pandemic, future studies should focus on understanding how different levels of capital adequacy impact a bank's financial performance. Finally, given the continued importance of asset quality and earnings quality in determining a bank's financial strength, future studies should also focus on how these factors interact with each other and with capital adequacy to impact financial performance. The study also recommends

that future research related to CAMELS framework should be implemented on other financial institutions such as investment banks, specialized banks, Islamic banks and insurance companies.

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**Appendix II: Analysis Guide****LIST OF COMMERCIAL BANKS IN KENYA**

1. African Banking Corporation Limited.
2. Absa Bank Limited
3. Access Bank Limited
4. Bank of Africa Limited
5. Bank of Baroda Limited
6. Bank of India Limited
7. Stanbic Holdings Limited
8. Charter House Bank Limited
9. Commercial Bank of Africa Limited
10. Co-operative Bank of Kenya Limited
11. Credit Bank Limited
12. Development Bank of Kenya Limited
13. Diamond Trust Bank Kenya Limited
14. Eco Bank Kenya Limited
15. Spire Bank Limited
16. Equity Bank Limited
17. Family Bank Limited
18. SBM bank Limited
19. Guaranty Trust Bank
20. First Commercial Bank Limited
21. Giro Commercial Bank Limited
22. Gulf African Bank
23. Habib Bank A.G Zurich

24. I&M Bank Limited
25. Kingdom Bank Limited
26. Kenya Commercial Bank Limited
27. Sidian Bank Limited
28. Middle East Bank
29. National Bank of Kenya Limited
30. M Orient Bank
31. Paramount Universal Bank
32. Prime Bank Limited
33. Standard Chartered Bank
34. East African Development Bank
35. Mayfair CIB Bank
36. NCBA Bank
37. Victoria Commercial Bank
38. Post Bank
39. Charter House Bank
40. Commercial Bank of Africa
41. Guardian Bank Limited
42. Gulf African Bank

## Appendix III: Output For The Models

### Model 1: Regression for Control Variables-Fixed Effects

Random Effects GLS regression	Number of observations= 290				
Group variable: Firm	Number of groups = 29				
R-sq: within = 0.04963	Obs per group: Min = 2				
R-sq: between = 0.0247	Avg = 10				
R-sq: overall = 0.031 92	Max = 10				
Corr (u_i, X) = 0 (assumed)	Wald $\chi^2$ (2) = 32.71				
	Prob > $\chi^2$ = 0.0000				
TA	Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]
Constant	-3.58	0.0378599	3.23	0.000	-0.0278232 0.1205851
Firm size	2.11	0.2398624	4.29	0.000	-0.0117894 0.0149288
Firm Age	-0.26	0.0069902	5.08	0.0612	0.0217892 0.0491903
Sigma_u	0				
Sigma_e	0.32				
rho	0	(fraction of variance due to u_i)			

### Model 2: Fixed-effects (within) regression

	Number of obs	=	290		
	Number of groups	=	29		
Group variable: firmID	Obs per group: min	=	2		
R-sq: within = 0.5512	Avg	=	10		
between = 0.44567	Max	=	10		
overall = 0.5012	F(7,182)	=	65.3		
corr(u_i, Xb) = -0.0457	Prob > F	=	0.000		
<b>ROA</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>T</b>	<b>P&gt;t</b>	<b>[95% Conf. Interval]</b>
FS	1.262	0.541	-1.980	0.047	-2.132 -0.013
FA	0.683	0.122	1.500	0.133	-0.056 0.423
CA	0.130	0.029	4.49	0.000	0.073 0.186
ME	0.632	0.094	-6.310	0.000	-0.776 -0.406
AQ	0.070	0.040	1.97	0.049	- 0.009 0.149
EQ	0.142	0.071	-4.850	0.000	-0.482 -0.203
LI	0.103	0.835	-1.170	0.245	-2.619 0.674
SMR	-0.597	0.257	-2.400	0.017	-1.123 -0.109
cons	1.467	2.355	0.710	0.480	-2.979 6.313
sigma_u	1.982				
sigma_e	1.2326				
Rho	0.254	(fraction of variance due to u_i)			
F test that all u_i=0: F(24, 182) = 5.47 Prob > F = 0.0000					
Source (Field data, 2022)					

**Model 3: Fixed-effects (within) regression**

	Number of obs	=	290
	Number of groups	=	29
Group variable: firmID	Obs per group: min	=	2
R-sq: within = 0.5656	Avg	=	10
between = 0.44567	Max	=	10
overall = 0.5012	F(7,182)	=	65.3
corr(u_i, Xb) = -0.0457	Prob > F	=	0.000

ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
FS	3.123	0.541	-1.980	0.047	-2.132	1.013
FA	0.567	0.312	2.500	0.001	0.856	0.423
CA	0.130	0.029	4.49	0.000	0.073	0.186
ME	0.632	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.070	0.040	1.97	0.049	0.009	0.149
EQ	0.142	0.071	-4.850	0.000	-0.482	-0.203
LI	0.103	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.597	0.257	-2.400	0.017	-1.123	-0.109
BFE	0.053	0.013	4.32	0.000	0.019	0.0491
cons	1.467	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.982					
sigma_e	1.2326					
Rho	0.254	(fraction of variance due to u_i)				

F test that all u\_i=0: F(24, 182) = 5.47 Prob > F = 0.0000

Source (Field data, 2022)

**Model 4: Fixed-effects (within) regression**

	Number of obs	=	290
	Number of groups	=	29
Group variable: firmID	Obs per group: min	=	2
R-sq: within = 0.5892	Avg	=	10
between = 0.4783	Max	=	10
overall = 0.4597	F(7,182)	=	65.3
corr(u_i, Xb) = -0.0567	Prob > F	=	0.000

ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
FS	2.125	0.541	-1.980	0.047	-2.132	-0.013
FA	0.537	0.122	1.500	0.133	-0.056	0.423
CA	-0.595	0.185	-3.21	0.001	-0.958	-0.232
ME	-0.664	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.096	0.010	9.370	0.000	0.076	0.116
EQ	1.092	0.071	-4.850	0.000	-0.482	-0.203
LI	0.644	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.473	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.421	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	0.456	0.004	3.260	0.001	0.006	0.022
cons	1.112	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.367					
sigma_e	1.156					
Rho	0.257	(fraction of variance due to u_i)				

F test that all u\_i=0: F(24, 182) = 5.47 Prob > F = 0.0000



**Model 5: Fixed-effects (within) regression**

	Number of obs	=	290			
	Number of groups	=	29			
	Obs per group: min	=	2			
Group variable: firmID	Avg	=	10			
R-sq: within = 0.5892	Max	=	10			
between = 0.4783	F(7,182)	=	65.3			
overall = 0.4597	Prob > F	=	0.000			
corr(u_i, Xb) = -0.0567						

ROA	Coef.	Std. Err.	T	P>t	[95% Conf.]	Interval]
FS	-1.382	0.541	-1.980	0.047	-2.132	-0.013
FA	0.537	0.122	1.500	0.133	-0.056	0.423
CA	-0.595	0.185	-3.21	0.001	-0.958	-0.232
ME	-0.664	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.096	0.010	9.370	0.000	0.076	0.116
EQ	1.092	0.071	-4.850	0.000	-0.482	-0.203
LI	0.644	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.473	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.421	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	0.456	0.004	3.260	0.001	0.006	0.022
AQ * BFE	1.002	0.5734	2.050	0.003	1.017	0.812
cons	1.112	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.367					
sigma_e	1.156					
Rho	0.257		(fraction of variance due to u_i)			

F test that all u\_i=0: F(24, 182) = 5.47 Prob > F = 0.0000

**Model 6 : Fixed-effects (within) regression**

	Number of obs	=	290			
	Number of groups	=	29			
	Obs per group: min	=	10			
Group variable: firmID	Avg	=	10			
R-sq: within = 0.6017	Max	=	10			
between = 0.4812	F(7,182)	=	65.3			
overall = 0.50623	Prob > F	=	0.000			

ROA	Coef.	Std. Err.	T	P>t	[95% Conf.]	Interval]
FS	-1.072	0.541	-1.980	0.047	-2.132	-0.013
FA	0.183	0.122	1.500	0.133	-0.056	0.423
CA	0.049	0.020	2.400	0.016	0.019	0.089
ME	-0.68	0.094	-6.310	0.000	-0.776	-0.406
AQ	2.027	0.006	4.960	0.000	0.017	0.0381
EQ	0.97	0.071	-4.850	0.000	-0.482	-0.203
LI	0.59	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.616	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.616	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	-0.012	0.006	-2.670	0.008	-0.020	-0.003
AQ * BFE	-0.002	0.004	-0.050	0.961	-0.017	0.006
ME * BFE	0.497	0.169	-2.940	0.003	-0.828	-0.166
cons	1.667	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.275					
sigma_e	1.454					
Rho	0.435		(fraction of variance due to u_i)			

F test that all u\_i=0: F(24, 182) = 5.47 Prob > F = 0.0000

**Model 7: Fixed-effects (within) regression**

	Number of obs	=	290			
	Number of groups	=	29			
Group variable: firmID	Obs per group: min	=	2			
R-sq: within = 0.6284	Avg	=	10			
between = 0.4864	Max	=	10			
overall = 0.4987	F(7,182)	=	65.3			
corr(u_i, Xb) = -0.0535	Prob > F	=	0.000			
ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
FS	2.45	0.541	-1.980	0.047	-2.132	-0.013
FA	0.183	0.122	1.500	0.133	-0.056	0.423
CA	0.735	0.162	4.53	0.000	0.417	1.053
ME	-0.68	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.026	0.006	4.56	0.000	0.015	0.038
EQ	0.97	0.071	-4.850	0.000	-0.482	-0.203
LI	0.59	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.616	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.616	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	-0.016	0.007	-2.83	0.005	-0.027	-0.005
AQ * BFE	0.000	0.006	0.126	0.907	-0.006	0.007
ME * BFE	0.004	2.23	0.026	-0.003	0.012	0.349
EQ * BFE	0.040	0.008	5.18	0.000	0.025	0.055
cons	1.667	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.275					
sigma_e	1.454					
Rho	0.435					(fraction of variance due to u_i)
F test that all u_i=0: F(24, 182) = 5.47 Prob > F = 0.0000						

**Model 8: Fixed-effects (within) regression -**

	Number of obs	=	290			
	Number of groups	=	29			
Group variable: firmID	Obs per group: min	=	2			
R-sq: within = 0.6473	Avg	=	10			
between = 0.5864	Max	=	10			
overall = 0.5316	F(7,182)	=	65.3			
corr(u_i, Xb) = -0.0855	Prob > F	=	0.000			
ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
FS	-0.013	0.333	-0.04	0.968	-.665	.639
FA	-0.000	0.080	-0.00	0.998	-0.158	0.157
CA	0.099	0.024	4.18	0.000	0.053	0.145
ME	-0.683	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.048	0.008	5.182	0.000	0.025	0.055
EQ	0.937	0.071	-4.850	0.000	-0.482	-0.203
LI	0.529	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.616	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.616	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	0.017	0.006	2.89	0.004	-0.029	-0.006
AQ * BFE	0.004	0.004	-3.06	0.002	-0.006	0.007
ME * BFE	0.005	0.005	-2.71	0.004	-0.003	0.012
EQ * BFE	0.003	0.015	0.693	0.492	-0.010	0.034
LI * BFE	-0.016	0.032	-2.83	0.005	-0.027	-0.005
cons	1.64	2.35	1.81	0.480	-2.07	1.313
sigma_u	1.275					
sigma_e	1.454					
Rho	0.435					(fraction of variance due to u_i)
F test that all u_i=0: F(24, 182) = 5.47 Prob > F = 0.0000						

**Model 9: Fixed-effects (within) regression -Full Model**

	Number of obs	=	290			
	Number of groups	=	29			
Group variable: firmID	Obs per group: min	=	2			
R-sq: within = 0.6597	Avg	=	10			
between = 0.5923	Max	=	10			
overall = 0.5108	F(7,182)	=	65.3			
corr(u_i, Xb) = -0.0955	Prob > F	=	0.000			
ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
FS	-1.072	0.541	-1.980	0.047	-2.132	-0.013
FA	0.183	0.122	1.500	0.133	-0.056	0.423
CA	0.996	0.914	-3.09	0.002	-2.787	0.794
ME	-0.682	0.094	-6.310	0.000	-0.776	-0.406
AQ	0.179	0.057	3.170	0.002	0.068	0.290
EQ	0.973	0.071	-4.850	0.000	-0.482	-0.203
LI	0.595	0.835	-1.170	0.245	-2.619	0.674
SMR	-0.630	0.257	-2.400	0.017	-1.123	-0.109
BFE	-0.616	0.257	-2.400	0.017	-1.123	-0.109
CA * BFE	0.138	0.028	4.84	0.000	-0.194	-0.082
AQ * BFE	0.055	0.022	2.47	0.014	0.011	0.098
ME * BFE	0.019	0.013	2.69	0.007	-0.016	0.034
EQ * BFE	-0.030	0.019	-3.61	0.000	-0.066	0.007
LI * BFE	0.138	0.040	3.472	0.001	0.060	0.216
SMR* BFE	0.952	0.200	4.773	0.000	0.561	1.344
cons	1.667	2.355	0.710	0.480	-2.979	6.313
sigma_u	1.275					
sigma_e	1.454					
Rho	0.435					(fraction of variance due to u_i)
F test that all u_i=0: F(24, 182) = 5.47 Prob > F = 0.0000						

